No.3

BIG K

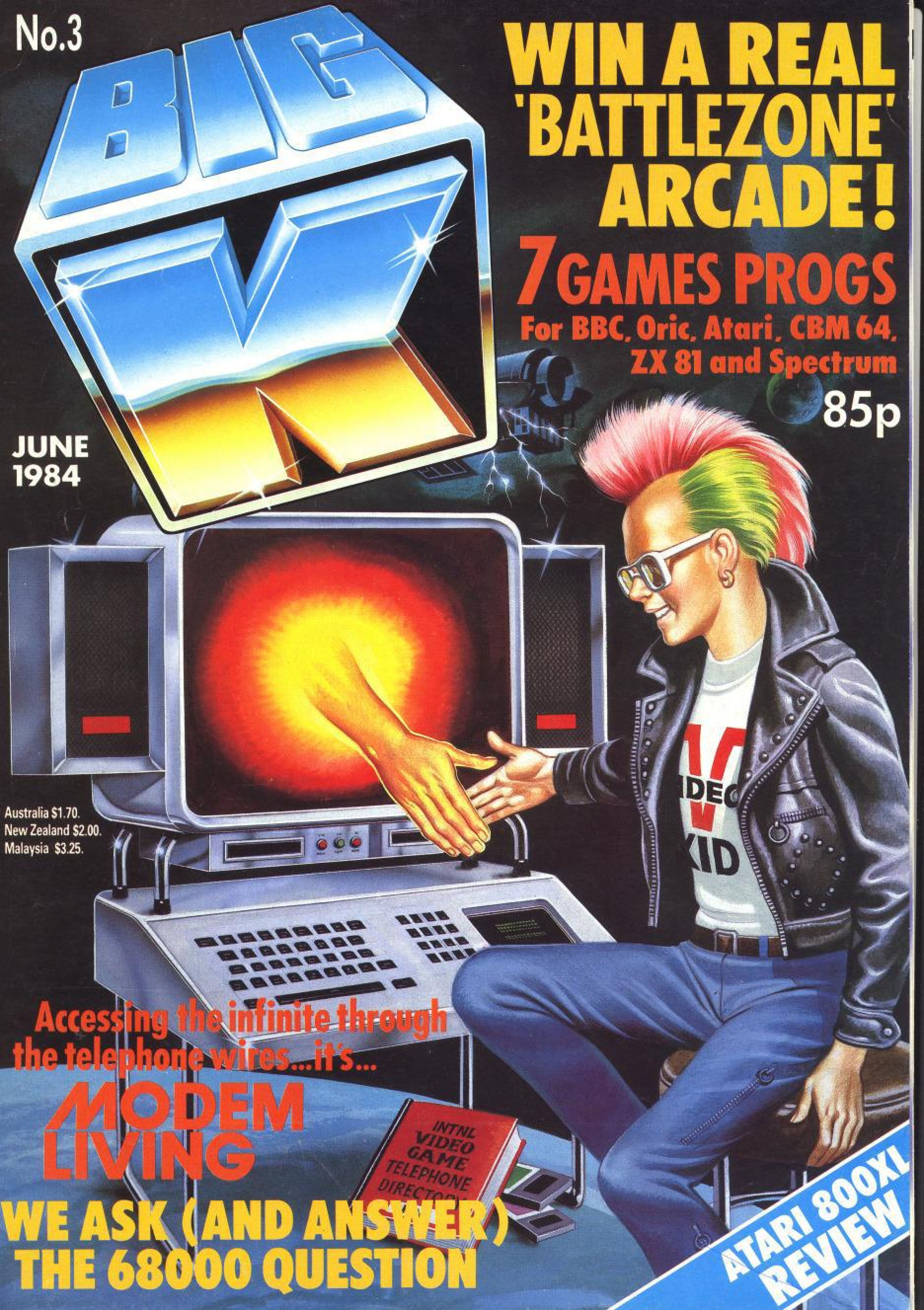
JUNE 1984

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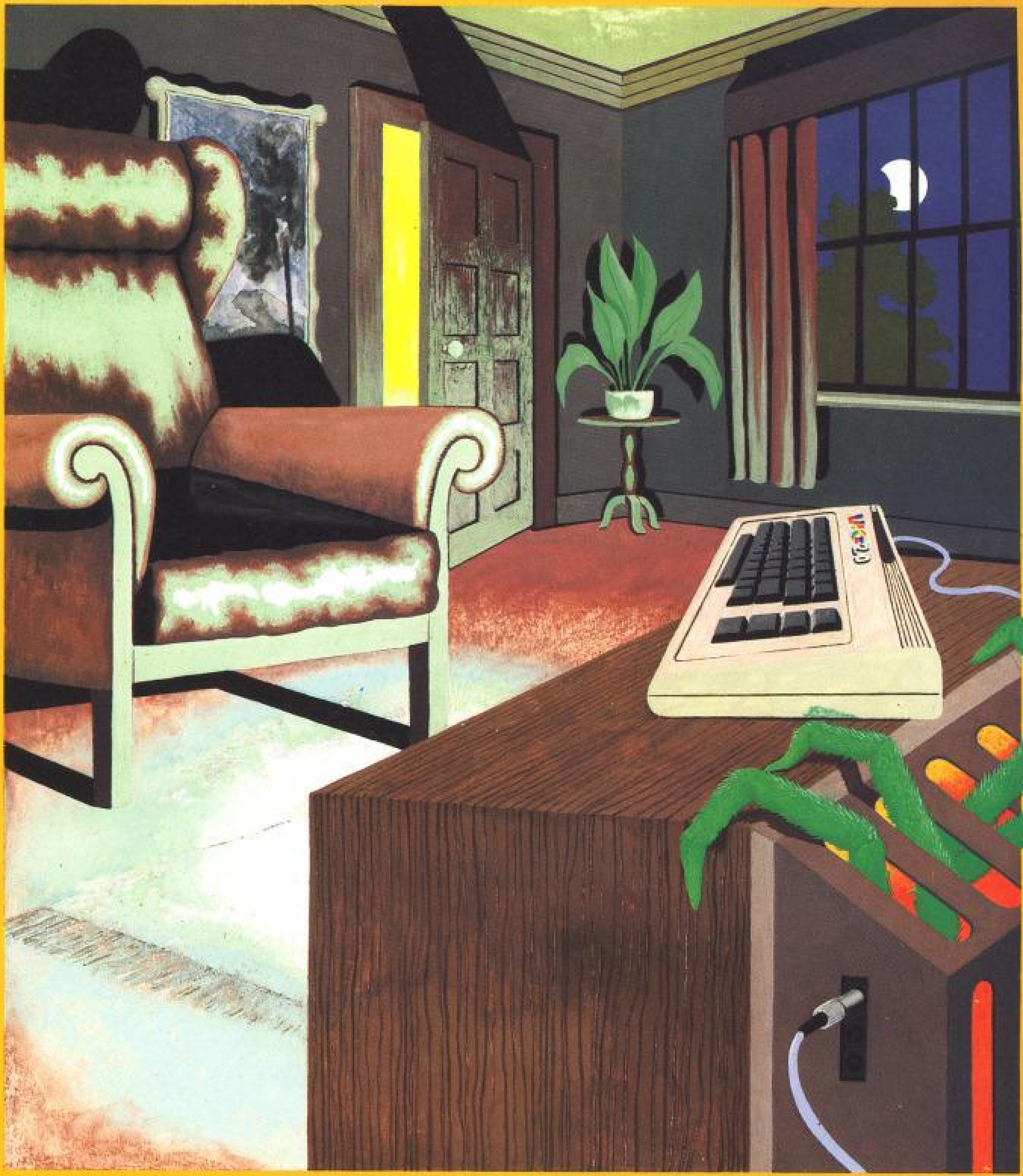
Accessing the infinite through the telephone wires...it's...

MODEM LIVING

WE ASK (AND ANSWER) THE 68000 QUESTION

ATARI 800XL REVIEW

Audiogenic Vic-20 Games...



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IN THE NAME OF THE LAW

By the time you read this the Video Recordings Bill will be on the verge of becoming law (see page 3). The main thrust of the Bill is directed against video 'nasties', with which this mag, thankfully, has little to do. What does concern us is that, almost as an afterthought, computer software has been rowed in — as if a program made up of bits and bytes, and a sordid piece of filmic tripe, are one and the same thing.

It's not yet clear how this will affect professional writers of games software. One thing's for sure: it will only take one demented Whitehouse-figure to claim that this or that computer game (not much scope for 'obscene' spreadsheets) is either 'obscene' or 'likely to deprave and corrupt' and a bust could follow.

It's probably too late for second thoughts; so we'll just have to hope that the Courts will have more sense than Graham Bright, MP.

Not difficult, on present form.

TONY TYLER

Contents

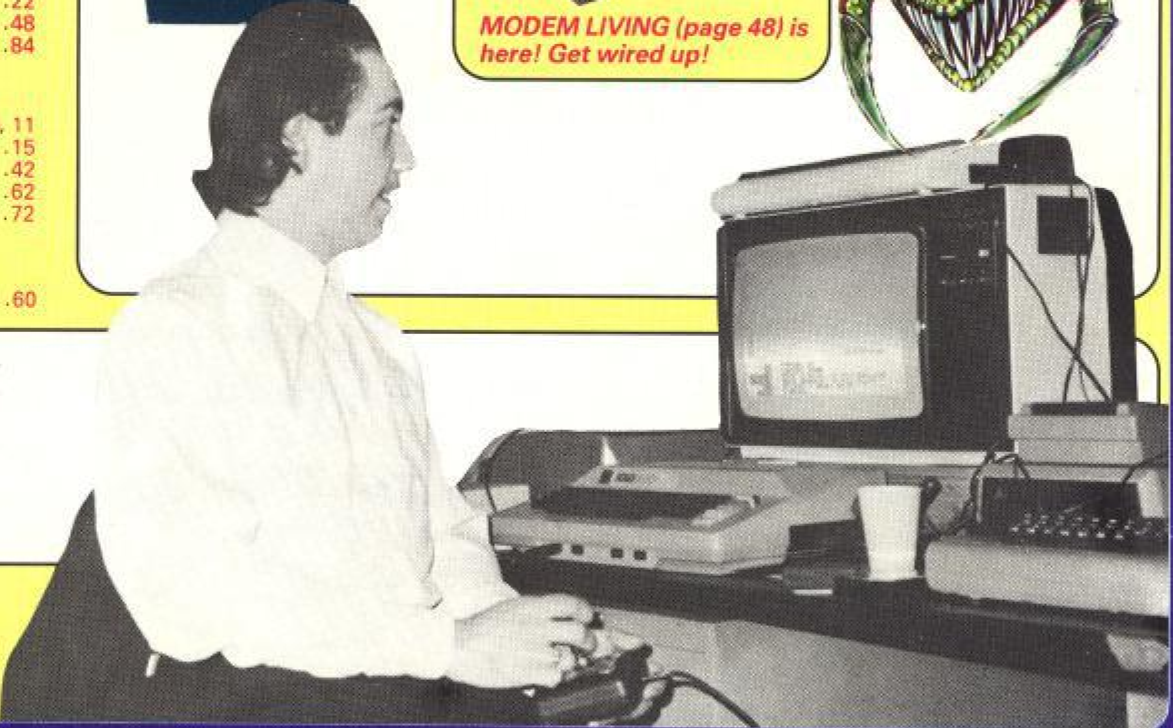


This month's Big Kompetition (page 60-61) prize is a real Atari Battlezone Arcade machine — the game that brought vector graphics, real tank steering and panoramic feel to armoured warfare. There's never been anything like it.





MODEM LIVING (page 48) is here! Get wired up!



PETE SHELLEY (right) is the former leader of the New Wave Romantics The Buzzcocks — and probably the most computered-up of all pop stars. Read his review of computing music-writing progs on page 66.

FRONT COVER: Global Handshake by Ron Embleton

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NOW AT LAST!

Cuthbert

ON THE

Commodore 64



Yes at last those fantastic top selling games for the Dragon are now available for your Commodore 64. Avoid those Marauding Moronians in "Cuthbert Goes Walkabout". Fight for survival in "Cuthbert in the Jungle" or plunder the Moronians planet in "Cuthbert in Space". These great games are a "must" for your software collection.

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CENSORSHIP:

Are You Ready For Software Nasties?

SOFTWARE AUTHORS may soon have to submit their progs to scrutiny by an Official Censor — if a Parliamentary Bill goes through as expected next month.

This is happening because of provisions in MP Graham Bright's Video Recordings Bill, designed to deal with so-called Video Nasties. Bright's Bill makes no distinction whatever between computer programs and movies on video.

"I incorporated the software clauses in the Bill," he told BIG K, "as a result of some obscene videos imported by a Clacton company last year." Reminded that the said videogames were never actually prosecuted for obscenity — and that they had been cleared by HM Customs — he said: "That's as may be. Just don't let anybody else try it all the same!"

The Tory MP was also apparently unaware that computer programs can be transmitted in written form ("I'll have to look into this"), but reluctantly conceded that his Bill has made no provision for this at all.

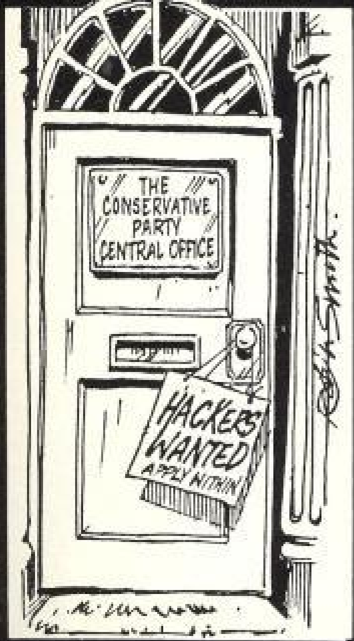
So, if you've a penchant for writing naughty software, pass it along as a BASIC listing. BIG K fancies that some interesting legal arguments might present themselves were a program listing — itself containing no actual obscenities — to be prosecuted for Filth. In the meantime, we're looking forward to seeing the Censor spending his days tapping in all those listing (in Commodore BASIC?) the mischievous might submit for "approval" when the Bright Bill becomes the Gloom Act. Be a way of stitching up the system, wouldn't it?

A further disturbing note: the Video Recordings Bill treats Sex and Violence as equally to be deplored. What about the violence involved in offing lots of little green men in spaceships? Will that apply? We'll keep you posted . . .



TARRANT RIDES AGAIN

YOU RAVED about *Tiswas*, you rioted about *OTT*, now revel in Chris Tarrant again as he presents *The World's Greatest Computer Games*, a new video cassette for sale or rent from TVC Video. Twenty of the most well-known computer games (*Manic Miner, Valhalla, et al*) are showcased in 30 minutes. Chummy Chris and his friendly rugby shirt make the whole thing very cosy. TVC hope to make a series out of this title and have Volume 2 already in production (without Tarrant as yet). Check your local video dealer for Chris' computer cassette.



What's the Password Brothers?

HACKERS WITH line-busting skills may soon find themselves being approached by shady-looking types in pinstripe trousers offering sums of money in exchange for their talents. This is because as of August 1 the Labour Party is renting itself a piece of Micronet with a view to using the database's facilities to communicate between various party HQ's.

"We're a lot more with-it than the other parties," claimed a Labour Party HQ spokesperson. "They would say that,w ouldn't they?" scoffed an SDP-Liberal lady, who went on to confess that although the Alliance would dearly like to try something of the same sort, the lack of centralisation might hamper things.

Over at Smith Square the Tories are already moderately computered-up, with a mainframe or two handling pinstripe data on a secure landline. No opportunities here for a little constructive sabotage.

The piece of Micronet the Brothers have rented is, of course, locked and secure. Sure it is. Meanwhile Labour have no fears that Tory hackers will bust into BrotherNet (or whatever it's called) and lay a few eggs or acquire interesting data (all of which would be illegal under new Tory proposals which have Labour backing).

"The Tories haven't got anybody clever enough to do that" scoffed the Labour man. Probably true. But they've got money, haven't they?

USE YOUR IMAGINATION . . .

. . . and think up some network names that the political parties might adopt if they were all to go on-net. NO POLITICAL PARTY EXCLUDED! (But don't go over the top — keep it printable.)

CASH FOR THE BEST — THE BIN FOR THE REST!

MORE NEWS PAGE 6

IN NEXT MONTH'S BIG K . . .

MERSEY BEAT: Imagine Software have the highest profile of any successful games company in the UK. They also operate from the country's most notoriously derelict metropolis. We check out their style.

CONFESSIONS OF A COMPUTER SNOB: Unrepentant prose from a loathsome elitist.

KEEP OUT! A watertight security prog for your Beeb.

PLUS Type-in games progs/Arcade Alley/News/Reviews/and much, much more.

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Our FREE catalogue lists dozens of programs for your Commodore 64 to help you run your business, write programs, or just enjoy yourself. We've been producing top quality software since 1978. So if you want the best, just remember our name . . . SUPERSOFT

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The Ill-fated Vectrex

Those Vanishing Videogames

VECTREX GOES EX -INTELLIVISION IFFY

THE VECTREX video game system is no more — it has bitten the Big One, gone to that Great Arcade In The Sky.

Launched in the UK barely a year ago, the unique, self-contained system (the only game system to use vector-scan graphics) came late to a video game market already under heavy siege from the snowballing computer phenomenon. Although computer-upgrade add-ons were promised from its launch most of these never appeared and Vectrex remained exclusively a games system. Ironically, the only move away from the games scene came earlier this year with the appearance of the *Vectrex Light Pen*. A case of too little too late.

In America, Vectrex parent company Milton Bradley has stopped production of the system and is dumping redundant stock at low prices. It has, however, promised to continue servicing units already sold.

As of going to press BIG K could get no concrete information out of MB's British operation. Vectrex Sales Manager John Garner would only confirm that the system had been discontinued in the US but as far as MB UK goes . . . "We're reviewing our marketing strategy" was all he'd say.

John Arundel of The Silica Shop, one of the first Vectrex outlets in the country, was sorry to see the system go. "It's a shame it didnt take off," he said. "But it came in at too high a price" (around £149) "and the market had already been established by systems like Atari's VCS at below the £100 mark."

So the videogame field is now left to the old, established, still-selling Atari *2600*, the add-ons-for-everything ColecoVision and the is-it-alive-or-is-it-dead Philips G7000 Videopac.

Deliberately left off this list is Intellivision. Supposedly 'dead' (*On-Line*, BIG K 1), latest reports from America now indicate that the corpse is still thrashing.

Mattel have sold the Intellivision part of the company off to the managers who used to run it. It remains to be seen if they will be able to make a go of it or not.



MOVE OVER MAGRITTE

64 OWNERS with the taint of paint in their bloodstream can now get daubing with the aid of a new graphics prog, *Paintpic*, brought to you courtesy of Kuma Computers.

Paintpic uses multi-colour bit-mapping techniques and requires no, repeat no extra hardware. Painting modes can be Brush, Pen and Text; you can have curvy shapes (box, parallelogram), settable colour patterns, a variety of moves — point and block —and a host of select features such as SAVE, GET, MIX, etc.

Fifty pee less than twenty quid buys you the entire package — something sorely needed by the fast-growing number of 64 types with ambitions to be hung (in art galleries).

FACE IT, YOU'RE ALL WIMPS

HOW MANY manufacturers have not spent somnambulent nights searching for that essence of thrill-power that makes a game shift from the shelves like Kaolin tablets after a night on the Vindaloo?

And how many sociologists have not felt compelled to let fall the odd treatise on how vicarious video violence may be linked with a rising crime rate? Cornish software company Microdeal have tried to grasp this walnut of life — they have had the brilliant idea of asking games fans themselves what motivates their interest.

Microdeal distributed 2,000 questionnaires in shops, obtaining a 25% return rate. Respondents were asked to list a series of characteristics of games in order of preference. Most popular attribute was 'A Genuine Challenge'. Second came 'Life-Like Graphics', then 'Dramatic Sound Effects'. In sum, it seems that a truly great game must have a strong sensory input — and must be demanding without being (quite) impossible.

Strangely enough, 'Outlet for Aggression' came a dismal last on the list. This doesn't surprise us at BIG K, but it might disappoint a few sociologists. And who cares about them?

THE SHORT HELLO

ON WITH the grimy macs, the gumshoes and the Mickey Spillane lingo — Dan Diamond's back in town! Salamander Software's sleuthing superstar slips stealthily onto the Spectrum scene in September when all three of his (in)famous adventures are put out on one cassette, complete with a bumper illustrated case-file.

Dan's debut was on the Dragon in an eerie offering called *Franklin's Tomb*. Solving that provided clues to help with the next part of the series, *Lost In Space*. *Fishy Business* wrapped up the first *Dan Diamond Trilogy* (you mean there's going to be more?). Each adventure ran in text only but had location illustrations supplied in special case-file booklets.

Diamond has gone on to become an almost-cult figure amongst adventure fans and gets fan mail sent to his unmarked box at Salamander's Brighton HQ. BBC and Oric owners can now get into the Diamond act with Commodore 64 users soon to follow. As for Spectrum, it's a case of shee you in Sheptember shweetheart.

GULPO!

LIKE THE first drafts of all the best programs several 'bugs' managed to creep into the 'system' of BIG K issue 1. Most we spotted after it was too late to do anything, and severely beat ourselves about the head. Others we heard about via dozens of good-natured phone calls. If you were one of those callers — well, howdy doody.

Herewith a list of goofs, glitches and groaners that occurred in issue 1:

Brilliant Bodges (p.75). The address to send off to for the Eprom Programmer kits was missed out. Those still hot for a 'Cheapo Epro' should address all their enquiries to BIG K (EPROM), KING'S REACH TOWER, STAMFORD STREET, LONDON SE1 9LS. Send no money, you'll be notified as to availability.

Reviews (p.30). The prices for the two Imagine games, *Alchemist* and *Stonkers*, were given as £6.95 when everybody knows that all Imagine games are (or were) £5.50. You can probably pick these KKK-rated beauties up for less than £4. *Nostra culpa*, Imagine.

Bomb Run (p.38,39). Frustrated Oric owners add the following lines to the listing for pure happiness:

```
330 PRINT:PRINT "To do this, the buildings below have got to be demolished."
355 PRINT:PRINT "Press 'Cursor Down' key to release a bomb."
```

And type in these corrected lines:-

```
520 J=K+1:G=X:F=1:IFJ>26 THENRETURN
530 IFSCRN(G,J) = 91ORSCRN(G,J)=93THENW=W+1
640 J=J+1:B=B+1:GOTO530
730 DATA 125, 0, 0, 0, 62, 31, 62, 0, 0'
```

Contents (p.1). *Demon Driver* for Commodore 64? Well, no. As it says on the listing it's for the Dragon.

Save the City (P.58,59). Let's hear it for our Star Goof! We had lots of calls from confused CBM 64 owners. No wonder. It was a Vic 20 program! Stay tuned for upcoming rectification situations (ongoing).

NOW I DON'T WANT THIS SHOULD SCARE YA BUT MY BUNKMATE HAS MALARIA

COMPUTER SUMMER Camps are now an institution. For better or worse? Is the accepted picture (of happy, well-scrubbed teenage puterists ecstatically tapping away on IBM pc's) true? Or is it more a case of a few sulky prisoners moodily thumping on clapped-out PETs in a Nissen hut while somewhere a tap is dripping?

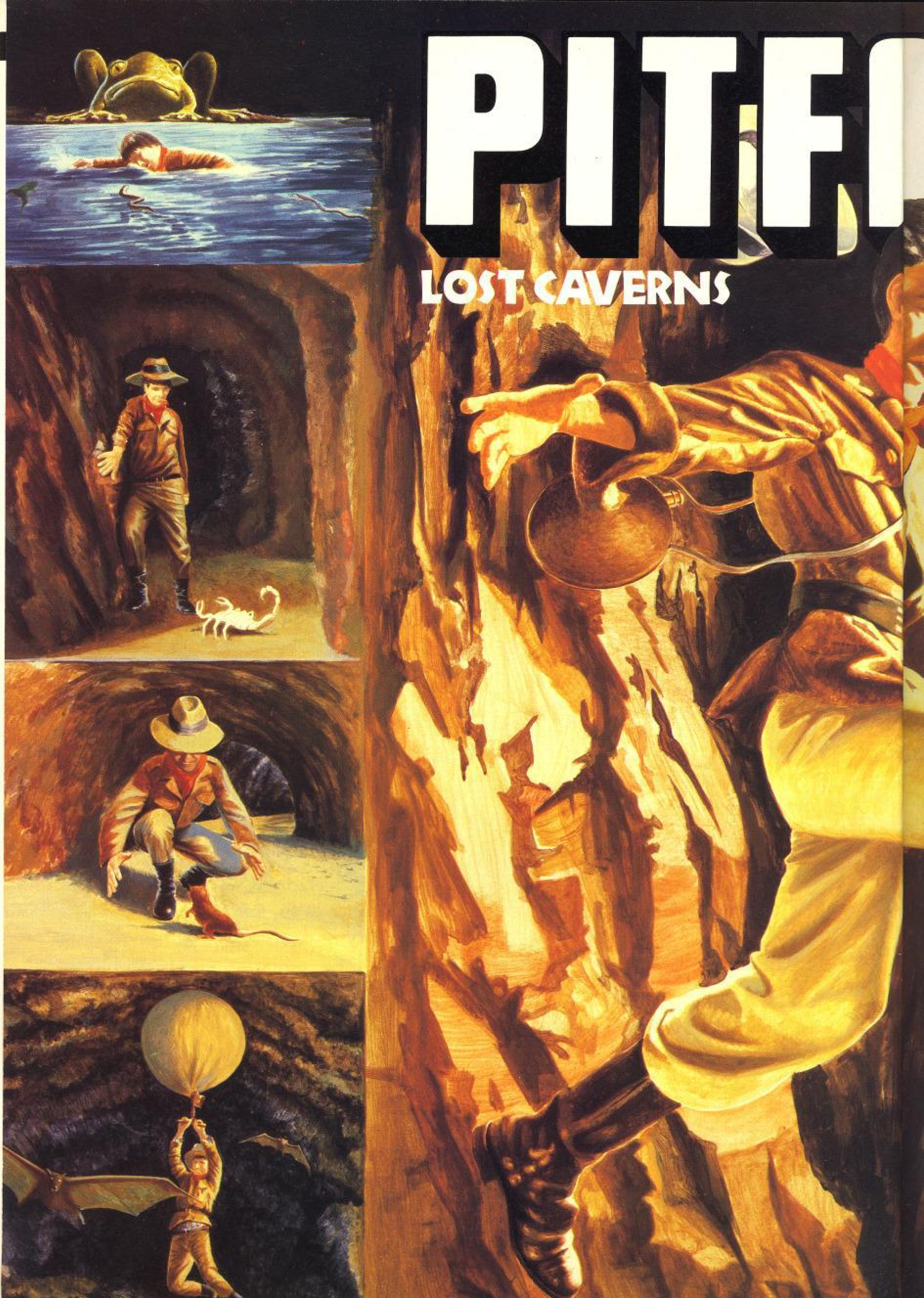
We here at BIG K would be just fascinated to find out.

Which is where you come in. This month, and over the next dozen or so weeks, a great many of you will find yourself in one or another of these places — in many cases willingly. All we ask is: when you get home, write to us and tell us all about it. We'll publish a selection of the best a little later on in the year.

Write to:
What I Did On My Holidays,
Big K Magazine,
IPC Magazines Ltd,
Kings Reach Tower (2026),
Stamford St., London SE1 9LS.

Oh yes — and enclose a mug shot. We may be hacks here at BIG K, but we like a laugh as much as anyone.

MORE NEWS PAGE 11


LOST CAVERNS


LL II
Starring
PITFALL HARRY
And introducing
RHONDA & QUICKCLAW
With
ANDEAN CONDORS
VAMPIRE BATS
POISONOUS FROGS
ELECTRIC EELS
ALBINO SCORPIONS
And
CAVE RAT AS HIMSELF
Designed and directed by
David "Pitfall" Crane.
An ACTIVISION Production
ACTIVISION
For the Atari 2600, Atari
home computers, Colecovision,
Commodore 64 cassette and disk.

ATARI UNVEIL TX-1

YOUR EYES bulge, your pulse races, sweat coats the steering wheel like an oil slick. Four channels of sound blast into your ear drums like pistons. In front of you three (count 'em) full-size, hi-res colour screens display one of eight international racing circuits which you are desperately trying to keep your car on. Other cars whizz by and your head involuntarily turns left and right in the direction of the sound.

One thing's for sure, if you're experiencing the above sensations you're sure as shootin' not playing the latest Spectrum or Beeb offering. What you are doing is sitting inside *TX-1*, the newest arcade zap from Atari.

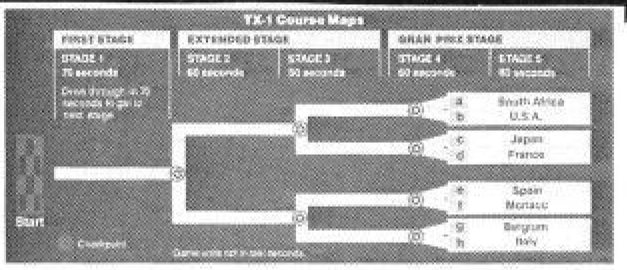
Three screens give 'Wrap-around action', providing a panoramic scenario as the cars race through cities, deserts, mountains, tunnels and more. The steering delivers actual feedback so that when you go into a skid . . . *you go into a skid!*

TX-1 leads a pack of new Atari arcade releases designed to gobble cash and dispense thrills.

Space Age is a laser disc based cartoon arcade game from the creators of the phenomenonally successful *Dragon's Lair*. Space action takes the place of Mediaeval action and Disney-lookalike characters once again roam arcade screens.

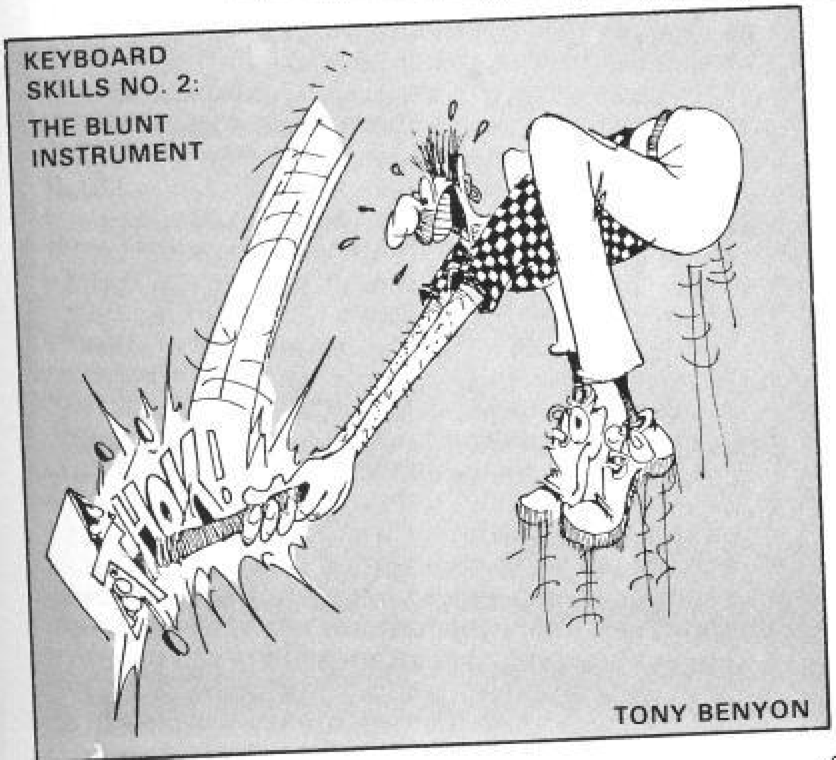
More on all these games in upcoming *Arcade Alleys*. Watch for 'em.





The flowchart for TX-1.

Bet you can't eat three!



KEYBOARD SKILLS NO. 2: THE BLUNT INSTRUMENT

TONY BENYON

GARBAGE IN GARBAGE OUT

By The Shadow

HIGH STREET Censorship Dept: following up a whisper that **K-Tel**'s *It's Only Rock 'n Roll* game had been rejected by everybody's favourite newsagent (on account of supposedly tasteless lyrics), **The Shadow** got on the case, only to be told that the chain store concerned operate no censorship policy "as such" and that the K-Tel prog had been deep-sixed on account of its supposed crash-proneness; K-Tel have now brought out a CBM 64 version of said prog anyway — and yes, the string data store HAS been cleaned up . . . Funny, that . . .

Congrats to **Acorn** for the current series of ads they're running in the Qualities — **The Shadow** particuarly likes the one where arrogant Etonian types pose coolly in front of a row of Beebs while a gowned **Quelch**-figure hovers in the background; only trouble is, who could possibly look at that old creep and imagine for a second that such a derelict would ever know zilch about computers? By the by, any punters out there who have The Goods on the real state of computers-in-schools should get in touch with **The Shadow**; anonymity guaranteed . . .

Whoever was minding the **British Micros** stand at the recent BBC/Electron Users' Show was certainly no expert at Making Friends — though in is own way he was quite effective at Influencing People . . . **The Shadow** has feelings, too, you know . . . And speaking of feelings, MP **Graham Bright** — the man behind the new wave of censorship — was easily twice as unpleasant on the phone as our story (page 3) makes out . . .

On a more cheerful note, mucho thanks for kind words about our first issue to: **John Conquest** at *Time Out*; **John Peel**, and *The Sunday Times*; **The Shadow** wishes to inform the above that any scam he may have been holding has now been binned out of sheer gratitude and brotherly love . . .



FOR BBC

By R. WATFORD

BLITZ!

You've flattened cities with jets and fast WWII bombers. Now introduce that oh-so-desirable antique touch by flattening a city with a vintage biplane — the discerning metrocide's equivalent of the London-to-Brighton run. Switches off! Contact!

```
  100REM          NEW_YORK
  110REM
  120REM         R. WATFORD
  130REM          13/3/84
  140REM
  150REM
  160ONERRORGOTO480
  170MODE2:VDU23;8202;0;0;0;:GCOL0,1:Z%=
0:DIMB%(19):ENVELOPE1,10,-1,0,0,255,0,0,
126,0,0,0,126,0:ENVELOPE2,1,-1,1,-1,1,2,
1,30,-10,-1,-30,126,126:*FX4,1
  180VDU23,255,0,102,102,0,0,102,102,0:V
DU23,254,124,124,56,56,124,124,56,16:VDU
23,253,240,160,160,184,255,248,0,0
  190VDU23,252,240,162,162,186,255,250,2
,2:VDU23,251,1,64,96,115,127,127,32,0
  200CL$=CHR$(8)+CHR$(8)+"  ":B$=" "+CHR
$(8)+CHR$(10)+CHR$(254):C$=CHR$(255):P$=
CHR$(8)+CHR$(8)+" "+CHR$(251)+CHR$(252):
P1$=CHR$(8)+CHR$(8)+" "+CHR$(251)+CHR$(2
53)
  210DEMO=FALSE:COLOUR1:COLOUR134:CLS:SC
%=0:D%=50:PRINTTAB(3,10)"PLAY NEW YORK"'
'''"Press a key or FIRE"
  220NOW=TIME+300:REPEATUNTIL(INKEY(0)<>
-1OR(ADVAL(0)AND3)ORTIME>NOW):CLS
  230IFTIME>NOW DEMO=TRUE:PROCTUNE
  240FLAG=FALSE:B%(0)=31:B%(19)=31:W%=0:
COLOUR7:COLOUR128:FORI%=1TO18:B%(I%)=RND
(5)+18:FORH%=B%(I%)TO30:PRINTTAB(I%,H%)C
$:NEXT:NEXT
  250COLOUR133:PRINTTAB(0,31)SPC(19);TAB
(0,0)SPC(60);
  260COLOUR1:COLOUR134:SOUND0,-15,3,255:
SOUND1,-5,1,255
```

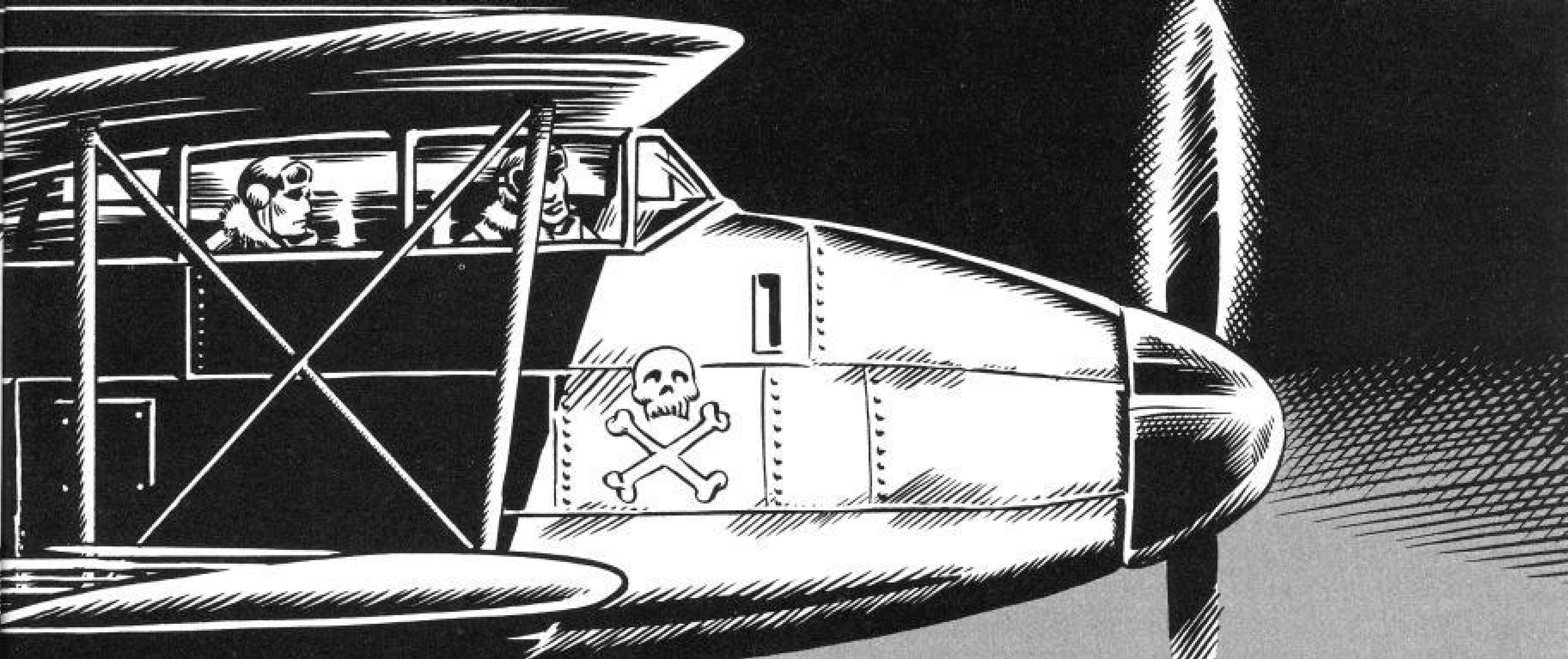


ILLUSTRATION: DAVID HINE

```
  270FORI%=4TO29:FORJ%=1TO19
  280PROCBOMB:IFB%(J%)<=I% PROCHIT:GOTO2
10
  290COLOUR133:PRINTTAB(1,1)"SCORE ";SC%
;TAB(11,1)"BEST ";Z%:COLOUR134
  300PROCPLANE:NEXT:PRINTCL$:NEXT:SOUND1
8,0,0,0
  310DOWN=TRUE:FORJ%=1TO18:IFB%(J%)<31TH
ENDOWN=FALSE:NEXT ELSENEXT
  320IFDOWN FORJ%=0TO9:PROCPLANE:D%=D%+5
:NEXT:SC%=SC%+100:D%=D%-65:NOW=TIME+500:
PRINTTAB(5,10)"BONUS 100":REPEATUNTILTIM
E>NOW:PROCOFF:CLS:GOTO240
  330J%=0:REPEATJ%=J%+1:PROCPLANE:UNTILB
%(J%)<31:PROCHIT:GOTO210
  340DEFPROCBOMB
  350IFH%>29ORH%>B%(W%)-2PRINTTAB(W%,H%)
" ";:SOUND18,0,0,0:GOTO370
  360COLOUR0:PRINTTAB(W%,H%)B$:COLOUR1:H
%=H%+1:FLAG=FALSE:IFH%>=G%SC%=SC%+1:ENDP
ROC ELSEENDPROC
  370IFFLAG W%=J%-1:H%=I%+1:G%=B%(J%-1):
B%(J%-1)=B%(J%-1)+6:FLAG=FALSE:SOUND2,1,
240,250:ENDPROC ELSEENDPROC
  380DEFPROCHIT:PRINTTAB(W%,H%)" ":SOUND
18,0,0,0:J%=J%-3:FORF%=0TO1:I1%=I%-1:J%=
J%+1:IFJ%<0 NEXT
  390REPEATI1%=I1%+1:PRINTTAB(J%,I1%)CHR
$(251+F%);CHR$(8);CHR$(11);" ":UNTILI1%>
B%(J%)-2ORI1%=30:*FX15,0
  400NOW=TIME+20:REPEATUNTILTIME>NOW
  410NEXT:I%=30:NEXTI%:IFSC%>Z% Z%=SC%:P
RINTTAB(3,10)"HIGHEST SCORE!"
  420NOW=TIME+500:REPEATUNTILTIME>NOW:CL
S:ENDPROC
  430DEFPROCPLANE:NOW=TIME:IFJ%MOD2=1 PR
INTTAB(J%,I%)P1$; ELSEPRINTTAB(J%,I%)P$;
  440IFDEMO THENREPEAT:FLAG=TRUE:UNTILTI
ME>NOW+D%:ENDPROC
  450REPEATIF(INKEY(0)<>-1OR(ADVAL(0)AND
3)) FLAG=TRUE
  460UNTILTIME>NOW+D%:ENDPROC
  470DEFPROCOFF:FORJ%=10TO19:I%=40-J%:PR
OCPLANE:PRINTTAB(J%+1,I%)CL$:NEXT:ENDPRO
C
  480IFERR=17THEN210ELSEREPORT:PRINT" at
 line ";ERL:*FX4,0
  490DEFPROCTUNE
  500FORI%=0TO28:READP%,X%,Y%
  510PLOTP%,X%*20+680,Y%*20+512:NEXT
  520READP,D:REPEAT:SOUND1,2,P,D:READP,D
:UNTILP=0:RESTORE:REPEATUNTILADVAL(-6)=1
5:CLS:ENDPROC
  530 DATA4,-19,0,4,-33,0,85,-33,13,4,-2
5,13
  540DATA85,-25,6,85,-19,6,85,-19,0,85,0
,0
  550DATA4,-19,6,85,0,10,4,0,0,85,15,10
  560DATA85,15,0,85,22,5,4,19,3,4,19,7,8
5,27,5
  570DATA4,15,15,4,-2,15,85,15,17,85,-2,
17
  580DATA4,-1,15,5,2,10,4,13,15,5,12,10
  590DATA4,25,12,4,24,5,85,26,5,85,25,-2
  600DATA101,15,121,7,101,7,101,7,93,3,8
9,3,93,7,101,7,89,15,107,7,89,7,89,7,81,
3,73,3,69,7,81,7
  610DATA73,10,81,3,89,7,109,7,101,10,89
,3,101,13
  620DATA81,7,101,7,109,3,117,3,121,7,11
7,29
  630DATA101,15,121,7,101,7,101,7,93,3,8
9,3,93,7,101,7,89,15,109,7,89,7,89,7,81,
3,73,3,69,7,81,7
  640DATA73,7,77,7,81,7,89,7,93,7,121,7,
117,7,109,7,89,15,81,15,73,30,0,0
```

A parasite is eating away at the bowels of the computer games business. Soon, say some, tape piracy will have done what no self-respecting parasite does and bumped off its host. And then it'll be no use moaning . . .

by TONY TYLER

SAY NO TO YOUR NEIGHBOURHOOD TAPEWORM

THIS ARTICLE was kicked into being by a weighty, slightly ponderous but without a doubt serious-minded 'Round Robin' recently dispatched by the mighty scousers Imagine Software and addressed to 'The Media'. i.e., us, and our competitors.

The subject was tape piracy. 'A cancer eating away at the heart of the industry' raved the Imagine document. 'Seven illicit copies for every one sold!'. User groups get it right between the eyes. 'Mini production lines stealing as many as 2000 copies of successful titles at one go!' is how they're described. It is, you might say, a wrathful screed.

Almost — but not quite — simultaneous with the Round Robin was an announcement to the effect that Imagine would henceforth cut their prices to £3.95 per — certainly a useful and constructive anti-pirate move.

OK, it's perfectly too easy to adopt a glib, laid-back position and say, yeah, well Imagine are always making this big deal about how much cash they've got, right? What was it Mark Butler said in this very mag last month? "The biggest problem I have is in spending the money"? So a few fatcats lose a few hundred thou off the top of their legendary millions? So what?

Profit

Shortsighted, Murgatroyd, very shortsighted. Yes, it's perfectly true that Imagine's ultra-high profile with regard to profit ("We've just got Eugene a Lotus Esprit") makes shrill complaints about loss of profit look a bit . . . superfluous. But really their success, or style, has nothing whatever to do with the substance or otherwise of their case.

Have they got a case?

We think they have.

Despite the fact that (when you come to think about it) nobody can possibly know exactly how many pirate copies circulate, or form anything but a rough guess.

And despite the fact that the Round Robin urges us media types to get our weight behind a campaign for 'harsher penalties'.

Despite all this, yes, they still do have a very substantial case.

LET'S FACE it, copying a program written in BASIC is not only easy, it's a vital and necessary feature of every microcomputer. All you do — sorry about this, Mark, Bruce, David and Ian and all at Scouse House — is press BREAK (or ESCAPE on the BBC) and then SAVE.

I'm not giving away any secrets here; nor am I condoning any sort of rip-off. It's a well-known technique and — considering that everybody wants backups of his own progs — neither illegal nor contemptible.

It's when you have the same smart-ass. knocking out copy after copy of the same game via his Spectrum that you have the beginnings of a problem.

And when you have an Arthur Daley figure sitting in a Stepney basement, smoking a fat ceegar while his custom duplicator rolls off THOUSANDS of copies of a Hot Hit . . . then you have a REAL problem.

Unlistable

OK, games in BASIC are getting few and far between these days (and a good thing too). Machine code progs are quite simply unlistable, and therefore, to the home copyist, uncopyable.

Aren't they? Well, no.

Well, surely all these copyright-detection devices wot we hear so much of must be useful? Yes they are — but it's almost always only a matter of time before some attic-ridden hacker shatters the midnight calm of suburbia with a scream of "GODDIT!" — and another electronic equivalent of Chubb's safes has bitten the dust.

Why bother? 'Because it's there', says the ice-cool hacker, choosing to regard what he does as a sort of challenge, like getting lost on the Cairngorms in midwinter.

'I only made that one copy for Wally!' says the aggrieved Grange Hill Tyke — the kind of lad who carries razorblades in his Spectrum. "Wally wouldn't have bought that one anyway."

(It's for sure Wally won't buy it now.)

'Pirate? Me?' says the basement Arthur Daley, as his custom duplicators roll on through the night. 'Well, maybe you have a point. Nice little earner, though.'

What can be done about it, anyway?

Bringing the price down is constructive (even if Imagine's competitors howled like stuck pigs). Continuing research into ever-tougher copyright protection devices is another useful road, with short-term benefits at least.

Imagine want a whole new slew of laws, though. And the trouble with Tough New Laws is that they have a habit of catching only the easily catchable. I mean, who wants to see our Grange Hill tyke — immoral little cherub tho' he is — arraigned before the Bloody Assize and transported for life (probably to Liverpool)?

And do we really want to discourage the kind of ingeniousness that leads experimenters to devise ways round protection devices? Yes, and no.

And yet something most definitely *has* to be done . . . if those Imagine figures are anything *like* right, then the software industry is bleeding to death.

The first thing is to make sure all commercial listings are in machine code; that way a majority of copyers simply have not the wherewithal to copy. Unless they have ghetto blasters with twin tape decks — THEN you need the protection devices.

Magazines such as ours should — must — begin to refuse ads for copier programs. These products are ingenious but have very few bona fide uses.

A third — sadly — is those Tough New Laws, with cutouts built in to protect the GHT from penal servitude in Liverpool on account of that one-off of *Alchemist* he made for Wally.

(The Software guys need all the Wallies in the UK to stay in business.)

What you can do:

DON'T buy unmarked cassettes.

DISCOURAGE your user group from wholesale piracy. Be sniffy about it if you have to.

DON'T rip anybody off. And no excuses — we all know a rip-off when it happens to us. Apply the same moral standards.

After all, you could be robbing someone you might need one day.



BIG K charts

SP = Spectrum, AC = Acorn, 64 = Commodore 64, **key** V20 = Vic 20, 81 = ZX 81, DR = Dragon 32, OR = Oric-1

TOP 30 GAMES (Retail)

			SP	AC	64	V20	81	DR	OR	Price
(5)	CHEQUERED FLAG	Psion	*							£6.95
(1)	MANIC MINER	Bug-Byte	*		*					£7.95
(3)	ATIC ATAC	Ultimate	*							£5.50
(20)	FIGHTER PILOT	Digital Integration	*							£7.95
(9)	SCUBA DIVE	Durell	*		*				*	£6.95
(4)	LUNAR JETMAN	Ultimate	*							£5.50
(11)	ANT ATTACK	Quicksilva	*							£6.95
(6)	FLIGHT SIMULATION	Psion	*							£7.95
(2)	HUNCHBACK	Ocean	*		*					£6.90
(10)	SPACE SHUTTLE	Microdeal	*	*	*				*	£8.00
(17)	JET PACK	Ultimate	*			*				£5.50
(7)	STONKERS	Imagine	*							£5.50
(8)	POOL	CDS	*							£5.95
(—)	JET SET WILLY	Software Projects	*							£5.95
(—)	BLUE THUNDER	Richard Wilcox	*							£5.95
(—)	POGO	Ocean	*							£6.50
(—)	WHEELIE	Microsphere	*							£5.95
(—)	BUGABOO	Quicksilva	*		*					£7.95
(21)	THE HOBBIT	Melbourne	*	*	*				*	£14.95
(12)	MR WIMPY	Ocean	*		*			*		£6.90
(14)	DEATH CHASE	Micromega	*							£6.95
(—)	CHINESE JUGGLER	Ocean			*					£6.90
(15)	THE ALCHEMIST	Imagine	*							£5.50
(26)	HORACE GOES SKIING	Psion/Melbourne	*		*					£6.95
(24)	CRAZY KONG	Interceptor			*	*				£6.95
(13)	KONG	Ocean	*							£5.90
(—)	FRED	Quicksilva	*							£6.95
(—)	THE SNOWMAN	Quicksilva	*							£6.95
(18)	VALHALLA	Legend	*							£14.95
(—)	HORACE AND THE SPIDER	Psion/Melbourne	*							£5.95

Compiled by MRIB Computer.

VIDEO GAMES (Dedicated Consoles)

1	(1)	POLE POSITION (Atari)
2	(2)	SUPER COBRA (Parker)
3	(16)	SPACE SHUTTLE (Activision)
4	(3)	POPEYE (Parker)
5	(4)	ENDURO (Activision)
6	(6)	Q-BERT (Parker)
7	(13)	DEATH STAR BATTLE (Parker)
8	(—)	MARIO BROTHERS (Atari)
9	(5)	DIG DUG (Atari)
10	(8)	MOON PATROL (Atari)
11	(12)	FROGGER (Parker)
12	(10)	BATTLE ZONE (Atari)
13	(—)	SNOOPY Vs THE RED BARON (Atari)
14	(14)	DONKEY KONG (CBS/Coleco)
15	(18)	PITFALL (Activision)
16	(11)	RIVER RAID (Activision)
17	(7)	TUTANKHAM (Parker)
18	(8)	BIG BIRD EGG CATCH (Atari)
19	(9)	GALAXIAN (Atari)
21	(15)	JUNGLE HUNT (Atari)
21	(—)	PAC-MAN (Atari)
22	(—)	SMURFS (CBS/Coleco)
23	(20)	KANGAROO (Atari)
24	(17)	COOKIE MONSTER MUNCH (Atari)
25	(—)	MS. PAC-MAN (Atari)
26	(—)	SORCERER'S APPRENTICE (Atari)
27	(—)	CENTIPEDE (Atari)
28	(—)	DECATHLON (Activision)
29	(—)	SPACE INVADERS (Atari)
30	(—)	ROBOT TANK (Activision)

Compiled by MRIB Computer.

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ANT ATTACK (Quicksilva)
BLAGGER (Alligata)
BUMPING BUGGIES (Bubble Bus)
CHUCK-E-EGG (A & F Software)
CONFRONTATION (Lothlorien)
DARTS (Mr Chip)
FIGHTER PILOT (Digital Integration)
FIFTH (CRL)
FLIGHT SIMULATOR (Salamander)
FLYING FEATHERS (Bubble Bus)
HELLGATE (Llamasoft)
HIGH RESOLUTION (CRL)
JACKPOT (Mr Chip)
JOHNNY REB (Lothlorien)
KILLER WATT (Alligata)
LUNAR JETMAN (Ultimate)
MEGAHAWK (Big G)
MONSTERS (Acornsoft)

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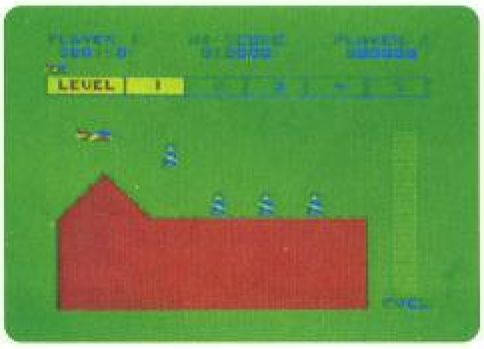
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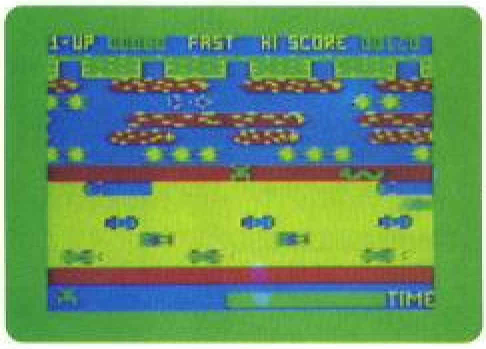




A



B

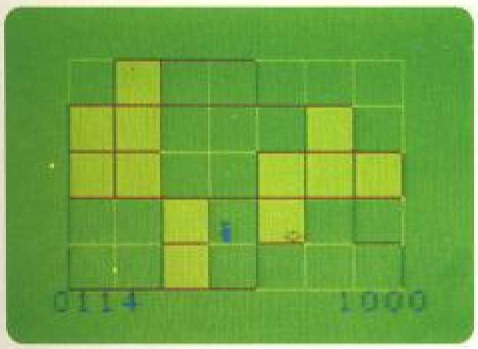


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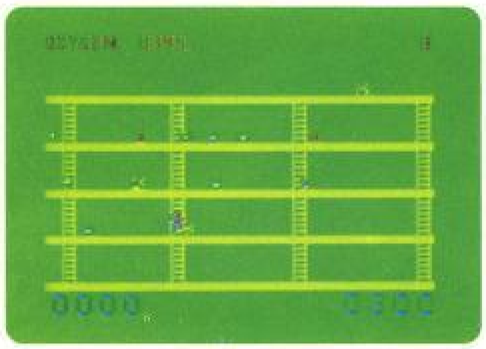
A **CRAZY PAINTER.** A high-speed arcade action game! Try your hand at painting the floor! Sounds easy? Yes, if the dogs, moths, caterpillars, boys, balloons etc. don't keep walking over the paint! Eight levels of difficulty. The catchy tunes played while you paint will have you "singing while you work". Keyboard or joystick controls. **26-7305**

B **SKRAMBLE.** Your mission is to penetrate the enemy's system and destroy their H.Q.. You will start with three spacefighters equipped with repeating cannon and twin bomb launcher. If you succeed in evading the elaborate defences, you will arrive at the core where flying becomes more difficult. Keyboard or joystick control. **26-7306**

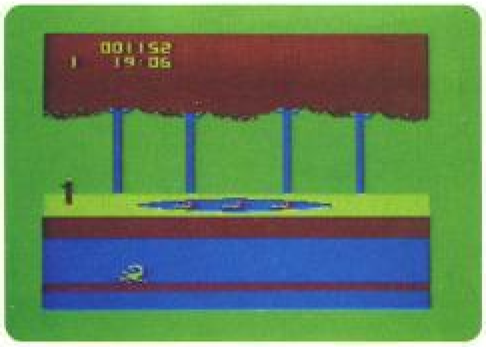
C **FROGGER.** The popular arcade game for the Tandy Colour Computer. Safely manoeuvre the frog to its home within the time allocated. Cross the highway without getting run over and cross the river without falling in. Avoid the traffic, snakes, crocodiles and diving turtles. For one or two players. Joysticks optional. **26-7304**



D



E



F

D **CUTHBERT GOES WALKABOUT.** Cuthbert must turn the lights of the lunar landing pad on by walking across the switches before the invading Moronians get him. Watch him do his victory dance before he tackles the next "pad" and another, larger, set of invaders. Superb colour graphics with music. Keyboard or joystick control. **26-7302**

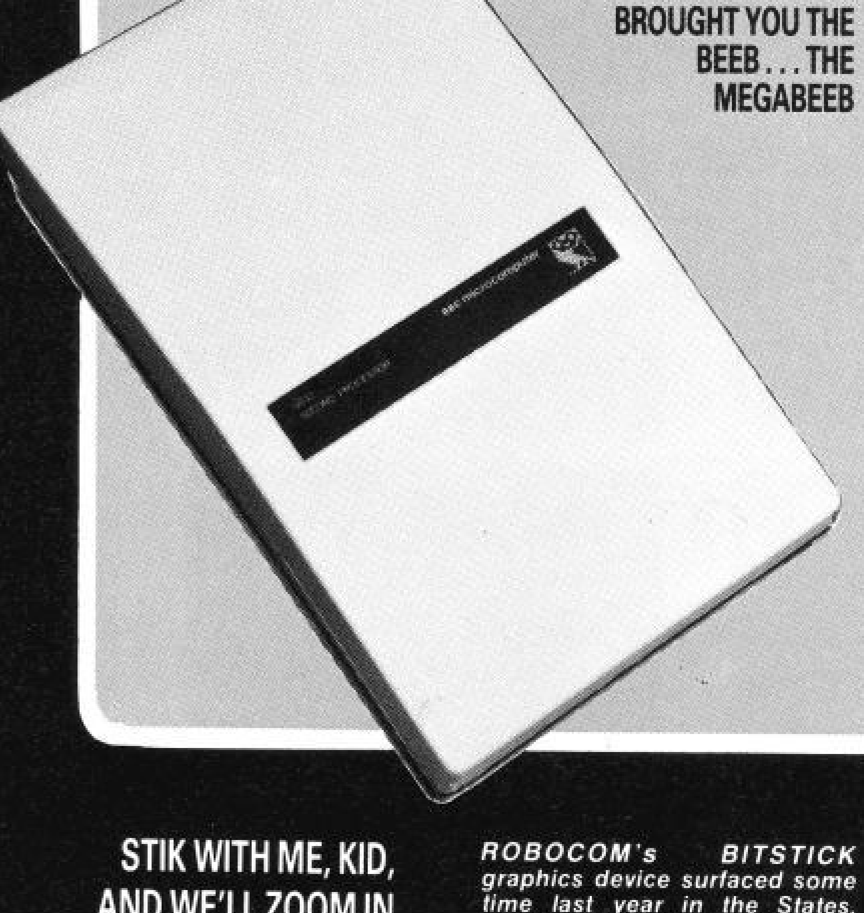
E **CUTHBERT GOES DIGGING.** Cuthbert is guarding the site for a new launch pad. However the Moronians are still determined to get him! One touch and Cuthbert is electrocuted. The only way he can kill them is to trap them in a hole and hit them with his insulated hammer before they escape. Keyboard or joystick control. **26-7303**

F **CUTHBERT IN THE JUNGLE.** A high speed arcade action game with full colour graphics! Cuthbert failed to overcome the Moronians so he has been sent to the jungle! He must fight his way out collecting treasures, jumping pits and swinging over alligators whilst being aware of the killer scorpion. One joystick required. **26-7301**

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WONDERFUL WIDGETS



FROM THE FOLKS WHO BROUGHT YOU THE BEEB . . . THE MEGABEEB

Acorn have been promisin 'glue on' *Second Processors* f the BBC for some time now. March one finally arrived.

There will eventually be thre models: this one (the 650 second processor), a Z80 wi CP/M and a 16032 megaen gine. By far the most interestin will be the 16032 machine, bu we'll have to wait a while un we get our grubbies on that.

With a second processor, th main BBC computer only get used for the laborious and tim consuming tasks like talking t disc drives, reading th keyboard and drawing on th screen, while the extremely fa add-on processor does all th hard work: arithmetic and shu fling numbers. This sharing the workload means tha graphics, for example, will wo much faster, because as th BBC is drawing a dot, th second processor can be work ing out where the next one going to go. Overall speed

STIK WITH ME, KID, AND WE'LL ZOOM IN ON THE BIG TIME

ROBOCOM's BITSTICK graphics device surfaced some time last year in the States, running on an Apple II. It was a sort of glorified Joystick with a control on the shaft that you can twist to change the third dimension.

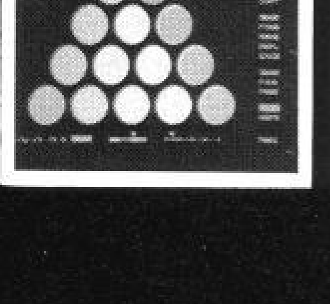
Critics clasped it to their collective bosom. Problem was, like all Apple gear, it was a little expensive . . .

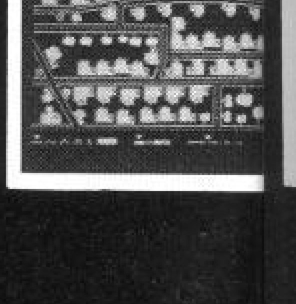
Now ROBOCOM, makers o the Bitstick, have bought out a Acorn badge engineere version for the BBC micro wit second processor. The softwar was already excellent (on th Apple). It just got a whole lo better.

You get sixteen 'colours (actually grey scaling) on Mod 1, and the most amazing curso we've ever seen. Most systems a anything near the 'professiona level support RUBBER BAND-ING, the ability to fix an origi and use the cursor to define th endpoint of a line — but mos systems only let you rubbe band a LINE! Bitstick ca rubberband tangent curves circles . . . you name it!

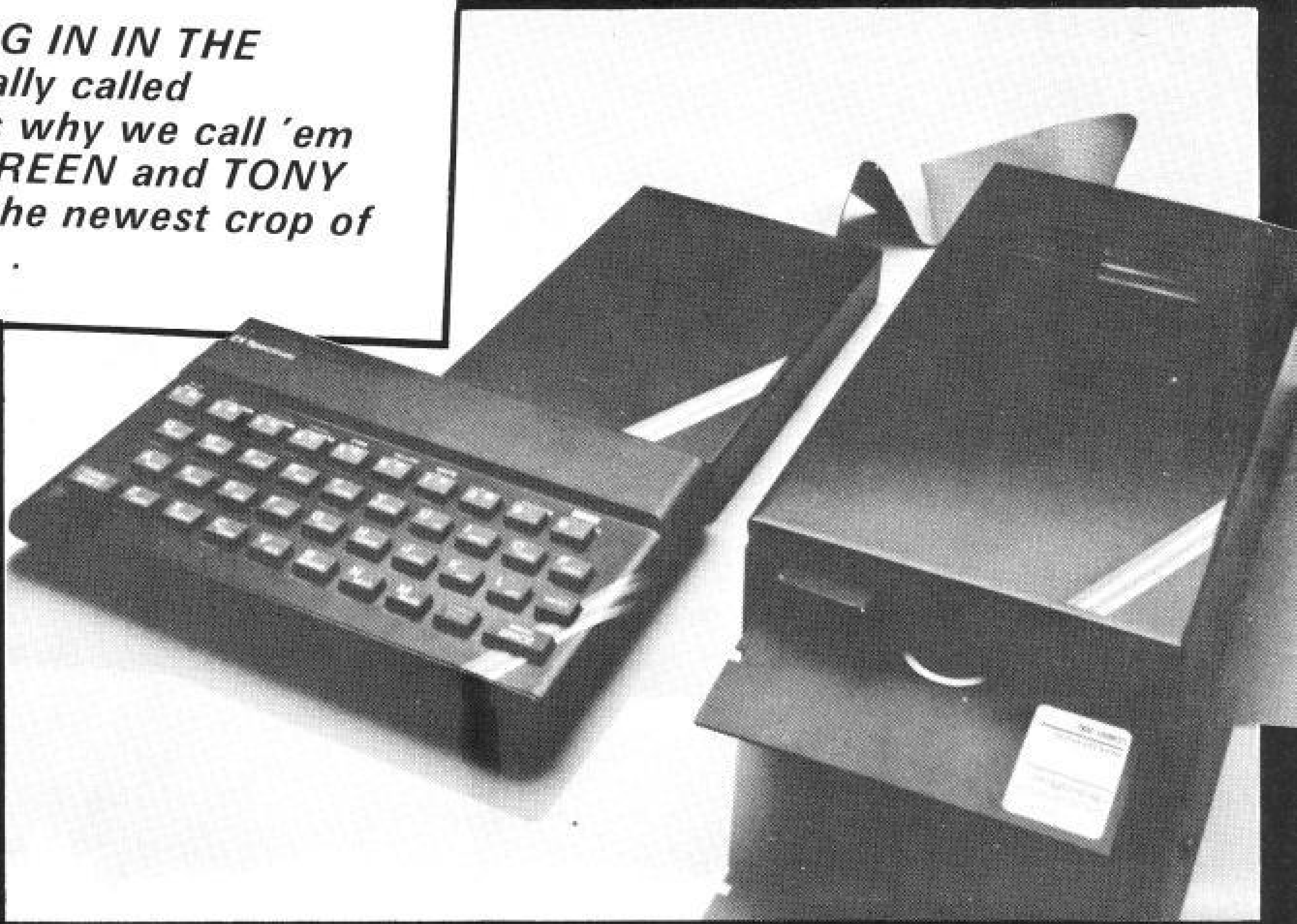
At the Acorn launch demon-stration, we were shown picture of an ocean liner. Usin Bitstick, we then zoomed in o the prow — where we could rea the ship's name. Then w zoomed into the porthole next t the name, revealing a cabin wit some cups and a stamp sittin







THINGS THAT PLUG IN IN THE NIGHT . . . are usually called 'Peripherals'. That's why we call 'em 'widgets'. ANDY GREEN and TONY TYLER investigate the newest crop of hopeful bolt-ons. . . .



improved by about 50%.

The second processor contains a fast 6502 (3Mhz, compared with 2Mhz in the BBC and 1Mhz in Oric and Commodore 64) and 64K of memory. Note that 16K of that 64K is 'nicked' to hold the BASIC interpreter, but you still get left with 44Kof memory to use, even in mode 2.

All is not Rosy in Acorn's garden, though . . . only programs that use documented OSBYTE and OSWORDS calls to interact with EVERYTHING will work on the second processor. Big K happens to know that hardly any games software meets this criterion — they all access the screen memory directly for extra speed. You can switch off the second processor and do a hard reset, though, to use the programs normally.

The 6502 version will set you back £199.00. — A.G.

on a table. We then zoomed into the stamp . . . and so on.

Flatbed

The system can be made very accurate — more than enough for draughtmanship use . . . 0.01mm, though you would need the flatbed plotter option — at the moment it will only print out on the Acorn sparkjet. By using an overlay of variable spaced dots (which can be 'transparently' laid out at any angle) the whole system can be made very accurate, since the cursor will 'latch onto' the nearest dot.

There's more: a graphical disc directory, object scaling, shearing, filling (the fastest colourfill I've ever seen) . . . If you've ever considered using a computer for professional graphics go see this system. You've fot to have a BBC B, dual disc drives, 6502 second processor, the Bitstick system and a sparkjet printer or Plotter touse the Bitstick — you should be able to get a complete set up for under £2000. Some comfort. — A.G.

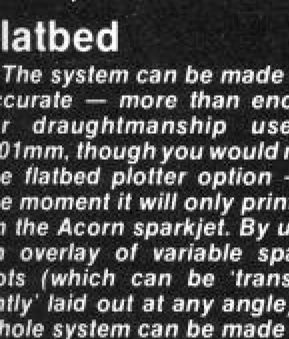
THIS DISC JUST SLIPPED IN

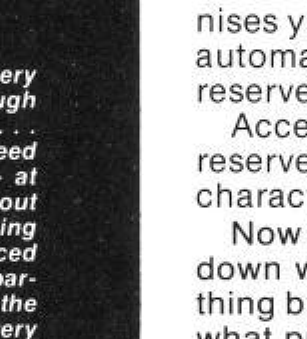
WHILE 'UNCLE' Clive pursued his own solution to the problem of mass-storage less costly than the original computer, enterprising folk elsewhere (actually Macronics Systems) gritted their teeth and settled for an orthodox disc drive. Now it's arrived.

It's heavy and solid, black, and comes in two pieces — the interface box and the actual drive unit, with the usual conger-eel of ribbon cable connecting the two. Drive mechanism is a Shugart SA200 which organises your data into 39 2816-byte tracks and 1 directory track. Starting-up automatically boots the operating firmware into the top end of RAM, and reserves space for buffers and reserved variables.

Access to data is enabled by use of the LET command and the F$ reserved variable (e.g. LET F$="filename"). Filenames can be up to 6 characters long.

Now for the shaming confession. We haven't — so far — got our heads down with regard to this one. (We could have cobbled together something but it wouldn't have done the widget justice). So . . . a full review of what promises to be a highly promising product in next month's BIG K. But we thought you'd like to know about it all the same. — **T.T.**





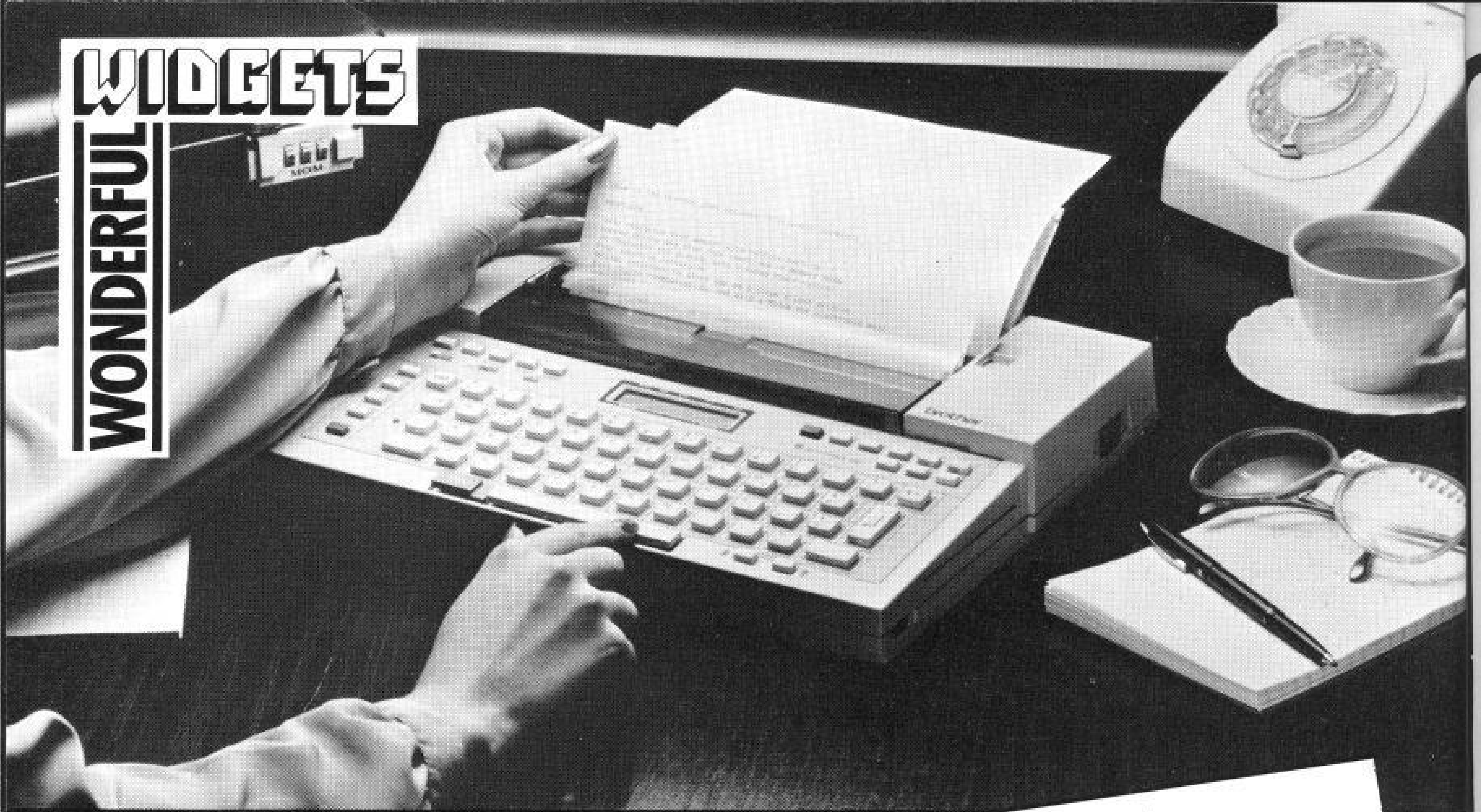
WE LOVE WIDGETS

There's nothing sets our pulses tingling here at BIG K so much as a really Terrif Periph. The ingeniousness, the variety, the riotous inventiveness — the sheer insantiy — of some bolt-ons leaves us aflame with admiration.

If you've heard of — or built — a widget, gizmo, peripheral, attachment, enhancer or anything else (it can be hardware, software or rubberware for all we care) that you think we should look at, then drop us a line here at:

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Continues over page



FOR THE HACK(ER) ON THE MOVE

YES, we know the thing isn't strictly our province, but the widget is so scrumptious, so absurdly wonderful (and we like ours so much) that if we didn't get it in somewhere we'd *have to give it back!* And that would never do.

So . . . for the discerning tape pirate who operates from the back of a Tranny and yet yearns to keep his correspondence tidy, we present the Brother EP-44 electronic typewriter. Also the Brother EP-44 computer printer. All in the same package.

Typewriter-wise, it's a dream. Allegedly dot-matrix, it prodúces superior letter-quality type on thermal or ordinary paper, with a whispering quiet that puts even Epsons to shame. You can type either directly onto paper, or phrase-by-phrase store-and-print, or you can create text (up to 4000 characters) directly into memory, printing the whole thing out later. And yes, the memory is non-volatile.

You can also use the EP-44 as a printer via its RS232 interface port, and as a communications terminal. It costs around £240.

★ Open ★ Wide ★ And ★ Say ★ Aaargh



Disc troubles? Help is at hand . . .

COMPUTER CONCEPTS, the people who are responsible for *Wordwise*, the BBC wordprocessor, have released several new programs over the past few months, but their most useful is a new PROM called *Disc Doctor*. Like *Wordwise*, it fits into the sideways ROM area of the BBC micro and its various commands are called up by use of the Command Line Interpreter (the * function in BASIC). Unlike *Wordwise*, however, the *HELP command is fully supported, giving a list of keywords the PROM understands and the syntax of each, just like the DFS does.

The reason that I'm writing this review is that I'm currently writing a special Compiling system called *Gillian*. A bug in the compiler (I guess we're all human) wrote some stuff to disc over the catalogue track, rendering the disc useless. There was no hope . . . but wait! Don't I recall reading about a new PROM? . . .

Eventually I found the CC ad and rushed to London to buy one. When I returned, I discovered to my horror that none of the disc-based *Disc Doctor* commands worked on the non-standard DFS I was using! Worst of all, the DFS was advertised (and I quote) as "compatible with all existing BBC software"!!! I love you too, LVL! Gibbering, I rushed over to a friend's house and swapped the DFS. At last!! I frenziedly checked through the manual and used the DZAP command. This lets you scroll up and down a 'window' on the screen in steps of 1 byte, 8 bytes, a sector at a time or a track at a time. The window displays the HEX and ASCII of what's on the disc at that point. You can edit the data in ASCII (the ASCII code of the character you type on the keyboard is used), Hex, Decimal and Binary. This is neat, easy to use and well thought out.

I was quickly able to work out that the catalogue on the disc had been corrupted, and — equally quickly — to rectify the error. It would've been even faster had I been the owner of a Disc User's Guide, but I refuse to pay Acorn's prices.

Talking of which, *Disc Doctor* is also — in my opinion — somewhat overpriced at £30. The 2764 EPROM used to contain the program cost less that £4 each in even small quantities, and the packaging and manual, both of which are quite good, could hardly cost £2 a time, leaving about ¾ of the price as overall profit.

HELP!

We want BIG K to be as good a magazine as we can make it — and we need YOUR help.

Just answer as many of the questions below as you can by ticking the boxes, then send the completed questionnaire to: BIG K (Readers Poll), IPC Magazines Ltd., Kings Reach Tower, Stamford Street, London SE1.

We're also looking for volunteers to serve on our Readers' Panel. Selected Panelists will be sent each issue of BIG K in advance of its appearing in the shops ABSOLUTELY FREE OF CHARGE. In return, we'll be keeping in touch with them, asking them their view on BIG K itself plus other computer-related subjects.

Remember — it's YOUR views we're interested in.

1. Do you *personally* own a computer?

	(10)
Yes	1
No — I use someone else's at home	2
No — I use one somewhere else	3
No	4

2. If you, *personally*, do not own a computer, are you planning to buy one?

	(11)
Yes	1
No	2

3. When you buy a computer game, what do you go for? Write in 1 for first, 2 for second, 3 for third, etc.

Good plotline	(12)
Good graphics	(13)
Smooth machine code programming	(14)
Lots of colour/sound	(15)
"Playability"	(16)

4. About how much money per month, on average, do you spend on software?

	(17)
Less than £5	1
Between £5 and £10	2
More than £10	3

5. Which of the following, if any, do you understand?

	(18)
BASIC	1
Another high-level language	2
Assembly language	3
No computer language	4

6. If you had a sudden windfall of £200 to spend on computer equipment, which of the following would you buy? Tick one only.

	(19)
The best micro you could afford	1
A disc drive for your existing micro	2
A printer	3

THINKING NOW ABOUT BIG K:

7. What do you think of the first 3 issues of the magazine?

	No.1 (20)	No.2 (21)	No.3 (22)
Liked it very much	1	1	1
Quite liked it	2	2	2
Didn't like it very much	3	3	3
Didn't see it	4	4	4

Return forms to:
BIG K (Readers Poll),
IPC Magazines Ltd., Kings Reach Tower,
Stamford Street. London SE1.

8. For which of the following would you like to see more features, program listings etc, in Big K? You may tick more than one.

	(23)
Spectrum/ZX81	1
Commodore 64/Vic-20	2
BBC 'B'/Electron	1
Atari	4
Dragon 32	5
Oric/Atmos	6
Other (WRITE IN) ________	(24)

9 In future issues of Big K, which of the following would you like to see?

	(25)
More program listings in BASIC	1
Less program listings in BASIC	2
Program listings in other languages	3
Utility programs	4

10. Which other computer magazines, if any, do you ever buy?

	(26)
Computer and Video Games	1
Personal Computer Games	2
Games Computing	3
Your Computer	4
Personal Computer World	5
Personal Computer News	6
Other (WRITE IN) ________	(27)

11. When you open computer magazine such as BIG K, which of the following do you turn to first?

	(28)
Program listings	1
Technical features	2
General interest features	3
Software reviews	4
Other (WRITE IN) ________	(29)

12. Would you like to help us by participating in future surveys like this as part of our Big K Readers' Panel?

	(30)
Yes	1
No	2

Please fill in this coupon, cut out the whole page and send it to BIG K etc.

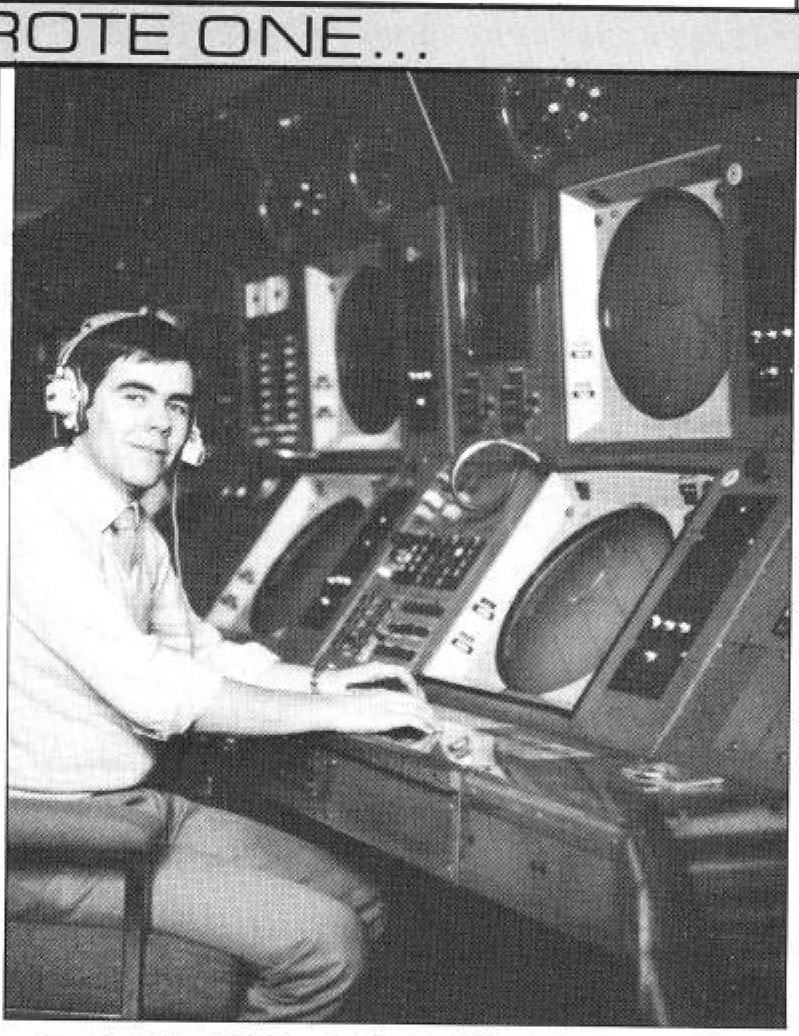
Name ....(31)

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Age ....(33)



THIS MIKE IS ALL MALE

Flight Simulation writing has its own problems and specialities. MIKE MALE, Air Traffic Controller, brings experience to the job. TONY TYLER interviews . . .



HEAVEN, FOR many connoisseurs of the cathode ray, will consist of an eternity spent in a darkened room staring at a VDU of hideous complexity. Throw in a real-time Panic Situation, load the shoulders of the screen-gazer with awesome responsibility — and you have a vision of paradise devoutly to be wished. By some.

Certainly Mike Male enjoys his work. His full-time, 'real' work, that is. As an Air Traffic Controller at London's Heathrow airport, he is one of the geezers whose "Roger Delta Bravo hold flight level one-zero-niner and turn left on to heading two-fiver-sixer" — type patter keeps the airways over southern Britain relatively free of falling aviation debris.

The games he writes in his 'spare' time, mind you, suffer no such inhibitions.

Male is 29, looks like long-lost pop star Dave Clark (of the Five), and has been an ATC for ten years. "I wanted to be an airline pilot, really," he says, with barely a trace of gloom. And as such he trained, only to fail the course at a late stage.

> *'I don't go in for tilting horizons. I'd rather have good daylight graphics. But the most important thing is instruments.*

Flying, however, is one of those occupations that holds you for life. Male flies a great deal in his spare time; works as an ATC; and is shortly to purchase his own aircraft. Are ATCs paid that much, then? No. The cash for the plane has come from the proceeds of the computer flight simulations Male has written over the last two years for Hewson Consultants: namely *Pilot* (for ZX81), *Nightflite* (Spectrum and BBC), *Nightflite 2* (ditto) and now, natch, *Heathrow Air Traffic Controller*.

Male started on the ZX81 and wrote *Pilot* in BASIC — which now appears to fill him with embarrassment. He made the inevitable simultaneous progression to Spectrum and Z80 Assembler; started from scratch again with the original *Nightflite;* and has now recently discovered the Acorn BBC machine, which has — needless to say — revolutionised his programming. Upwards.

What, in his view are the optimum requirements for a successful flight simulator — a relatively new but fast-progressing sub-genre of computer "game"?

"Basically, it all comes down to the screen. The pilot view. Enough has got to be in the program so that when the natural climax is reached — which is always the landing, as it is for real flight — the player feels he has had a realistic experience."

Male tends to reject the classic programming conundrum of the Tilting Horizon ("it never looks right anyway") and concentrates on atmospheric views ("enough objects on the ground to enable pilot orientation") and good, clear instrumentation. "The most important single instrument — in a program as in real piloting — is the artificial horizon; without this you can't do any instrument flying at all. You also need an altimeter and an airspeed indicator — digital readouts are OK, especially as constructing a workable and readible dial is virtually impossible."

The other main flaw (according to Male) in most flight simulator programs is the difficulty of building convincing daylight graphics — "this is the thing I want to do most of all. The Microsoft program" (for IBM PC) "is the best I've seen in this regard."

> *'I absolutely hate Adventures. And I've never had ambition to write anything like an arcade game. Flying's my thing.*

Has he ever wanted to try his hand at other genres of computer games?

"I can't STAND adventures — just not my sort of thing; and I've never wanted to write arcade games." They're not his sort of thing either. In fact, except in one respect — his tangible success — Male doesn't really conform to the rapidly-growing stereotype. No glasses. No zits. No manic unsociability. He's just a guy who loves flying and aeroplanes and knows a great deal about them; and who has put all of what he knows — well, nearly all — into a progression of specialist "games" of very high quality. And with the ever increasing popularity of flying simulators — one newie per fortnight is our estimate — you can see how a bloke on a civil service pay grade can now afford to buy his own plane.

Could you write a Flight Simulator?

If you've got the blood of the Red Baron in your veins and reckon you can handle this most demanding of programming skills . . . if your horizons tilt and your instruments work . . . if you know the difference between an altimeter and a cucumber sandwich . . . if your name happens to be Biggles . . . if any of these aeronautical parameters apply then START TAPPING. WE WANT TO HEAR FROM YOU. LISTINGS IN BASIC — FOR ANY MICRO. SEND 'EM IN. SOONEST. WE PAY. OVER AND OUT.

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DAWSON? SELL!

*INTERESTING ATTEMPT to style a board game for the Spectrum. In **City** you get to chomp on a stogie and play property developer with land hungry for urban decay.*

Starting with a bank balance of some £200,000 you must develop a city (what else?) and try and make a million. This isn't too easy as the computer quickly assumes the guise of a rival company and callously attempts to sabotage your constructions.

It's a deceptively complex game. You can erect a variety of buildings such as banks, shops and factories all of which effect the relative values of each other. This necessitates much strategic planning. F'rinstance the property value of your spanking new apartment block can be severly shaken should your cunning opponent build a smelly old pub directly opposite. Decidedly snobby don't you think?

*Each months rents are calculated, overdrafts totalled and profits assessed. There's provision for up to 4 players and a jail routine for the more shady developers. I've always found the desire for micro board games somewhat curious but this attempt works surprisingly well. The game is both original and demanding. I wonder if they'll do a board version... — **S.K.***

RIDE DAT DISC

THE DIMINUTIVE Q∗Bert's triangular stomping ground is the latest locale for Automata's ubiquitous hero, the Piman. Yep, the little horror is busy causing trouble for the hapless Bert as he hops merrily about, carelessly colouring the great Pyramid of Pi.

The gameplay is, of course, pretty familiar stuff. However, it's set apart from other Spectrum Q∗Bert clones by some truly splendid graphics. Bert has been skilfully drawn and his army of assailants are smoothly animated. Alongside Pi-nose you'll have to contend with the Bouncing Ball brothers, Sid the snake and Jas and Col (the authors?).

As you might imagine the pyramid soon becomes mighty crowded.

By way of a breather you can hop Bert onto one of two spinning discs which'll return him to the peak of the pyramid. This provides the most spectacular graphic routine in the game. Bert spins, in full perspective, majestically through the air. It's genuinely impressive. At the end of each bash you're given your score over a drink in the Automata bar, a nice finishing touch. Written in machine code (unusual for Automata) the game offers quality arcade thrills. Hardly original, I know, but certainly entertaining. — **S.K.**

Game: PI-BALLED
Maker: AUTOMATA UK LTD
Machine: SPECTRUM 48K
Format: cassette
Price: £6.00
Rating: KK



TURBO BREAKOUT

*THOSE WHO'VE considered Atari's **Super Breakout** the last word in bat and ball games would do well to check out this visually striking variation from Starpath. The massive memory of the Starpath Supercharger has enabled a number of artistic changes to be made. The humble bat has been transformed into a hi-res juggler and his balls (sic) are now red hot.*

*Like other **Breakouts** there's room for 1 to 4 players (no big deal there) but here you're given five neat game variations, including the frantic **Cascade** which features no fewer than five cavities, each with their own eager-to-escape ball, and the frustratingly difficult **Migrating Blocks** which boast a ridiculously efficient self-repairing wall. When you miss a ball, which is quite frequent considering you can have up to seven onscreen at the same time, a long purple crook snakes on from stage left and drags your man off by the throat.*

*It's all very nicely done. However, my curvy **Breakout** connoisseur reckons that despite all these visual niceties the games remain pretty easy-peasy as there's no variation of ball speed. An astute observation I think. Even so the smart audio visuals and competitive price make **Fireball** a notable entry in the fave old game stakes.* — S.K.

Game: FIREBALL
Maker: Starpath Corp.
Machine: Atari VCS with Starpath Supercharger
Format: Cassette
Price: £9.95
Rating: KK

DROID YAWN

UNEXCITING 'graphic adventure' (I'm growing slowly to hate that term) set upon the crudely etched planet of Zyro. Apparently one of your patrolling survey ships has been downed by a mysterious salvo of alien laser fire. Miraculously, though, an android has survived this attack, and he now stands amid the wreckage of the craft awaiting further instructions.

With what transpires to be a particularly limited vocabulary you must try and guide the little tin man about the surface of the planet and attempt to solve the riddle of the hostile blast.

The subsequent action (I use the term loosely) is then enacted across a static map with your android artfully represented as a white punctuation mark. Just nudge your marker around the planet and react to the messages displayed.

Yawnsville dad.

As you might imagine I found the thing exceptionally tedious. Progress is slow and the graphic display barely warrants a mention. — **S.K.**



Game: SPACE ISLAND
Maker: TERMINAL SOFTWARE
Machine: 48K ZX SPECTRUM
Format: cassette
Price: £6.95
Rating: None





Game: CITY
Maker: TERMINAL SOFTWARE
Machine: SPECTRUM 48K
Format: cassette
Price: £6.95
Rating: KK

HERE THEY COME AGAIN

I suppose it was inevitable. The Electron is a new micro on the scene and so a ripe new market for all the familiar game themes that have already saturated the older and more established machines.

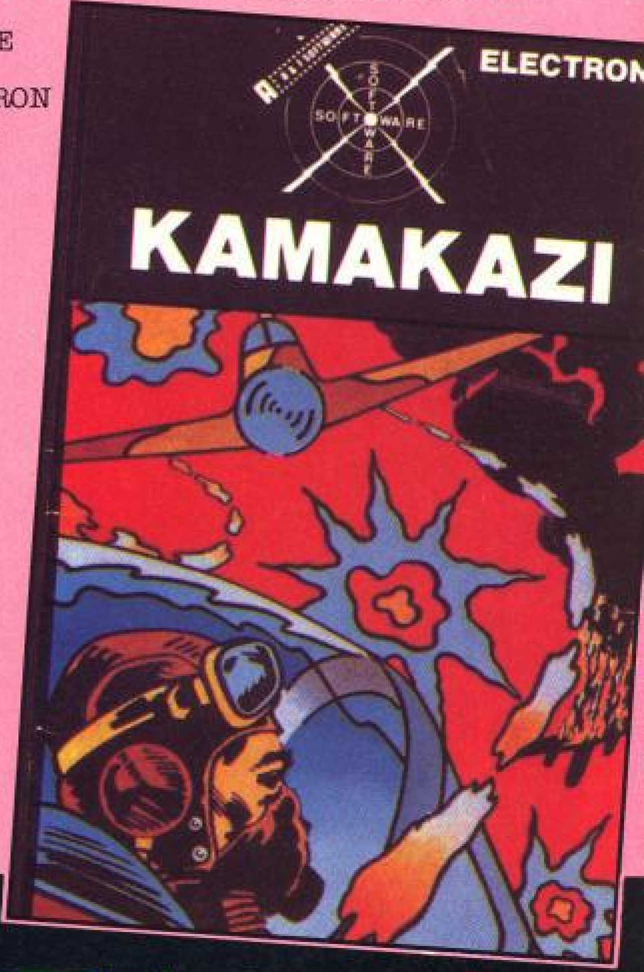
That said, *Kamikaze* is an early entry in the *'Galaxian* clone' area for the Electron. The space scenario has been replaced by a more 'down to Earth' setting. Shapes approximating planes and helicopters dive at a seagoing firing base. Other than that, play is virtually identical to *Galaxian*.

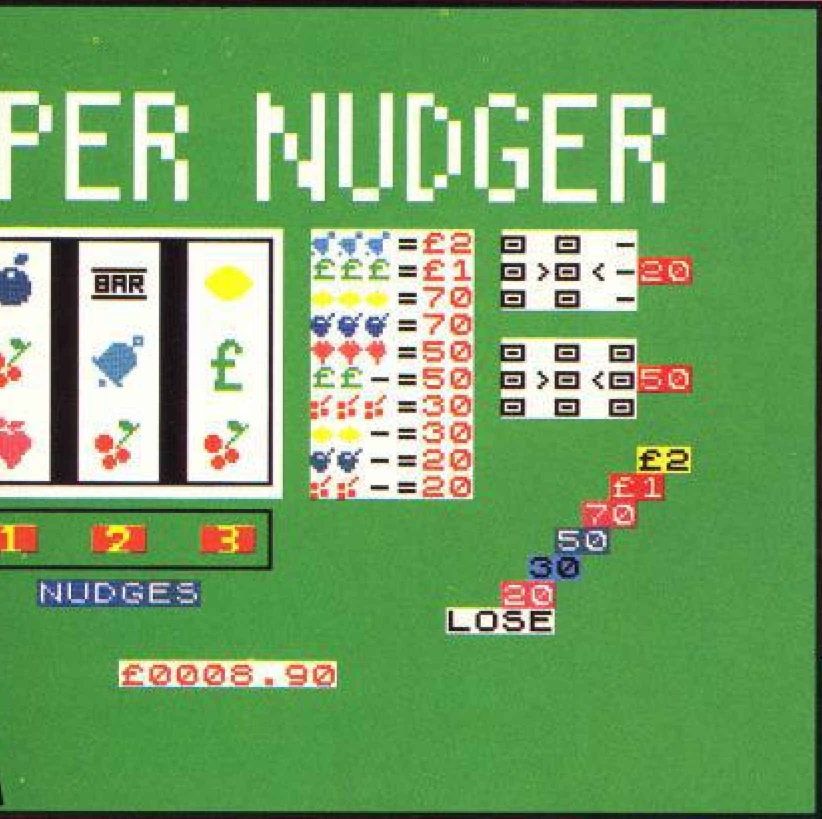
The action is reasonably fast even on the slowest of the two speeds. Graphics are average and sound is poor. It must be the first time I've come across a gun base that explodes silently!

Control is adequate with two choices of keyboard layout (oh for a joystick option on the Electron!). Instructions are sparse but there is a good high score table that rates you from Novice to 'Superman'.

An OK game for the arcade freaks but I'm sure there is better to come. — **R.B.**

Game: KAMIKAZE
Maker: A&F
Machine: ELECTRON
Format: cassette
Price: £7.90
Rating: K







YOU LOSE, PAL

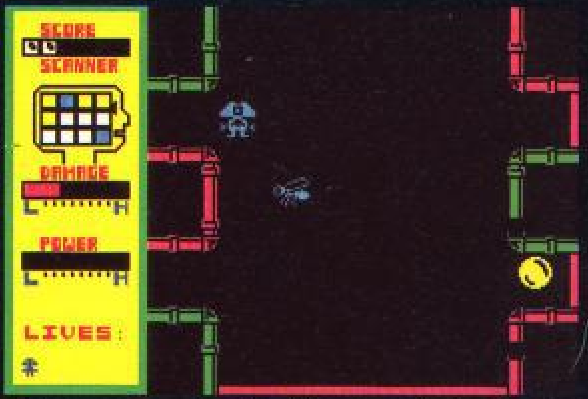
Hmm, THIS is interesting: an emasculated slice of vice for out-of-pocket gamblers. Or, to be more precise, a low key double bill featuring that indefatigable old pub dog, the fruit machine and a version of the popular card game, Blackjack.

The former boasts all the features you'd expect from a quality Fruit such as nudge, hold and gamble but it's cursed with a cluttered screen layout and some poor animation. Those all-important reels refuse to scroll the way reels should. They merely change in flickering sequence. It's far too crude a display to really satiate the discerning punter.

The Blackjack program is marginally more interesting. As with Pontoon (or 21), the idea is to break the bank with a five card trick. The game's a doddle to play and the visuals are quite neat, with the 'puter speedily unveiling your hand as you bravely twist. Unfortunately, though, there's no option to alter the stakes. A 10p wager is mandatory — not much help for us strategic players. Not that it would have made much difference anyway as I'm sure the deck was rigged. Those smarmy 'You Bust!' proclamations were far too frequent to be kosher. Still I guess it's cheaper than a Greyhound to Vegas... — S.K.

Game: LAS VEGAS
Maker: TEMPTATION SOFTWARE
Machine: SPECTRUM 48K
Format: cassette
Price: £5.95
Rating: K

Quick, Nurse — the Screens!



A FANTASTIC droid voyage, no less! In this new offering from Softek you become a miniscule brain surgeon incarcerated within the bug-ridden bonce of a not-so-super-robot. These bugs are busy sabotaging the poor ol' droid by ripping up his plumbing. As resident micro surgeon you must skate around the 12 sectors of the damaged droid and clean up the mess.

You'll need to repel the bugs with your stun balls and repair the dripping pipes before cumulative damage causes the poor old thing to collapse into an undignified pile of nuts and bolts.

Then, if you get the damage level down to around 12%, you're transported to another dodgy robot. Some reward, huh?

*The concept behind **Microbot** is refreshingly novel; unfortunately it's rather shafted by some sluggish gameplay. Your little micro surgeon can only trundle about in first gear and consequently the ensuing bug-battles are somewhat unexciting. A shame. Still the graphics are very good indeed and there's a wonderful selection of bugs to avoid.* — **S.K.**

Game: MICROBOT
Maker: SOFTEK
Machine: SPECTRUM 48K
Format: cassette
Price: £5.95
Rating: KK

DRAGON

CASTLE HASSLE

Uninspiring text adventure that dares you to venture into a dark old castle in search of the legendary Staff of Gomora. The program boasts 120 locations but whether you'll feel inclined to visit them all after your initial tentative steps across the drawbridge is another matter. I mean, there are so many faults with this that it almost becomes depressing listing them. A text adventure stands or falls by its literacy. Locations should be clearly described and messages interesting. After all the more evocative the text the more enjoyable the adventure's likely to become. Unfortunately 'Location: An allure' is not my idea of an elaborate description, but it's typical of *Castle Adventure.* Not only is the text brief but it's peppered with meaningless architec-



tural jargon. I mean, what's an Allure for God's sake? (Sounds like a loose woman.) Even worse, you are unable to act in any satisfactory way within the program. Try something interesting and you'll get the inevitable response 'Eh! What? Pardon?' Highly entertaining. Sudden death also abounds. For no apparent reason you'll trip over a cassette recorder and break your neck. What is a cassette recorder doing in a gothic adventure? Why are you given no indication of its presence? The whole thing is exceptionally tedious. This is one quest most definitely not worth girding your loins for. An Allure! Pshaw . . . — **S.K.**

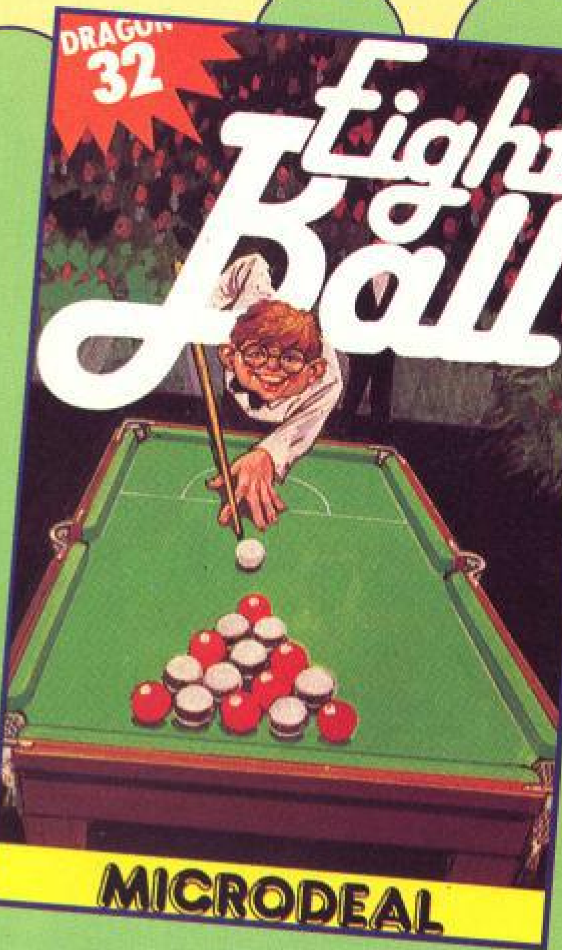
Game: CASTLE ADVENTURE
Maker: VIRGIN GAMES
Machine: DRAGON 32
Format: cassette
Price: £6.95
Rating: none



Hackers Against the Bomb

Interesting strategy game that has you donning the somewhat perilous guise of a bomb disposal officer. As is your luck you've been called to defuse one of those old wartime devices that are dug up with such alarming regularity. Even worse it's not one that you've seen before and so you'll require all your skill and ingenuity to defuse it. Hairy stuff! Just choose the correct items from your toolkit and decide what course to take. The program enables you to view the unexploded device from three angles before choosing from a menu of actions. Will you lift the bomb upright with the hydraulic jack or clout it with the copper hammer? Nerves of steel are a necessity. Should you manage to make any headway at all a help routine becomes available to guide you through the trickiest moments. I most certainly will not be taking up bomb disposal work full time. Almost every move I made resulted in a loud raspberry which rather symbolically denoted my premature end. Still for those of a methodical (not to mention suicidal) nature this might well provide amusement. — **S.K.**

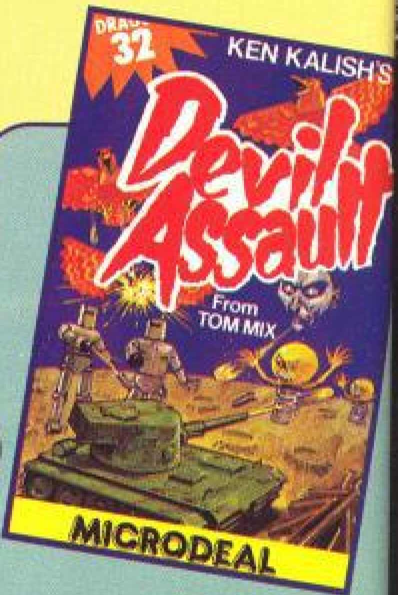
Game: UXB
Maker: VIRGIN GAMES
Machine: DRAGON 32
Format: cassette
Price: £6.95
Rating: KK



Perhaps one of the more curious game adaptations for the home micro is that of Pool. Decidedly non-violent with nary an alien to be seen, this pot-bellied perennial works surprisingly well. The pace is relaxed, lightning reflexes are most definitely unnecessary, and the skill level pleasantly high. The rules are also refreshingly simple. Just pot all your colours and sink the eight ball before your opponent. Incidentally you will actually have to collar an opponent as this Pool has no computer player option. The actual game is cleverly simulated. Once you've selected the angle of your shot using the joystick, a cue ball is displayed at the top of the screen along with a power-bar indicator. This enables you to select not only the strength of your strike, but the amount of spin that you want to put on the ball. Master this and you're well on your way to becoming a top hustler.

Although visually less exciting than some of the versions around for the Spectrum this features convincing sound effects and super smooth movement. My only real gripe is with its failure to display a score during play. Most of the usual Pool rules apply and I dare say regular players will find this a welcome supplement to their usual fix. — **S.K.**

Game: EIGHT BALL
Maker: MICRODEAL
Machine: DRAGON 32
Format: cassette
Price: £8.00
Rating: KK



Yet another winner from the dazzling digits of Ken Kalish, who almost singlehandedly has elevated the standard of Dragon software to arcade stature. This latest release features all of his usual trademarks — exceptional hi-res graphics, exciting sound and invigorating gameplay.

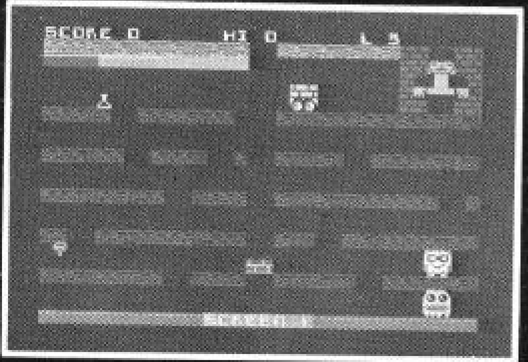
There are three screens to survive. The first features manic vampire bats who drop bombs and divide into two if hit by your laser fire. Knock one of these smaller bats out and its twin will come screaming down to ram you. It's rather like a turbo-charged *Demon Attack* only less forgiving. Clear two screens of these and you'll be rewarded with a robot attack! Little tin-plated terrors stomp down the centre of the screen disgorging death and destruction at every turn.

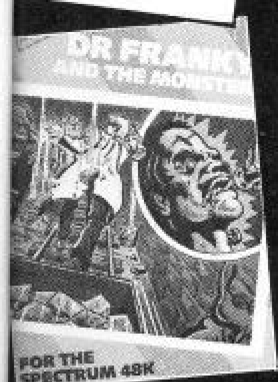
There are five skill levels to play. Should you be foolhardy enough to risk the upper levels there's a fair chance that you'll meet old Nick himself (hence the title). True to form he'll wreak havoc with a brimstone bombardment that'll rip up your starbase something rotten. *Devil Assault* is a feast of a game for those with an itchy trigger-finger. It's superbly executed and breathtakingly smooth. — **S.K.**

Game: DEVIL ASSAULT
Maker: MICRODEAL
Machine: DRAGON 32
Format: cassette
Price: £8.00
Rating: KKK

Reviewers:
Richard Burton
Tony Tyler
Richard Cook
Nicky Xikluna
Andy Green
Steve Keaton

K	=	Could Be Better
KK	=	Could Be Worse
KKK	=	Unsurpassable





IGOR! IT LIVES!

Virgin have yet to produce any genuinely outstanding games but after their initial crop of certified stinkers *Dr Franky* seems positively glowing. Martin Wheeler's game manages to remind you of several arcade prototypes without drawing too closely on any one.

The task is to manoeuvre the inane, bespectacled doc through various dungeons (nine screens in all), each abrim with grim-faced ghouls who obliterate him on touch. He can also be topped by falling brick walls or run down by what looks like a miner's caboose but if he manages to pocket the white phial on the top left of each screen and get it to his dozing monster he can move on to the next stage.

A simple three-key control lets him go left, right or jump — and since every screen is a maze of potholes and trapdoors our man often goes on a kind of ingenuous hopscotch. The monsters are pretty smart, though, and the 'magic hammers' which dot the screens are seldom of any use. Sparse sound and detailed, if rather familiar, graphics make this scientific *Kong* (its closest counterpart) an amusing if unremarkable proposition. — R.C.

Game: DR FRANKY & THE MONSTER
Maker: VIRGIN
Machine: SPECTRUM 48K
Format: cassette
Price: £5.95
Rating: K

PASS THE SICK BAG

A NOVEL twist on the familiar ***Asteroids*** theme where in your trusty spaceship suffers a radical refit and becomes not unlike a minature submarine. This is just as well as the scenario has changed from outer to inner space and those hurtling asteroids have become a deadly all-consuming virus, intent on infesting the heart of your beloved VCS. Definitely bad news.

It seems you have no choice but to navigate the murky Atari bloodstream and attempt to eradicate the ghastly growth. Unfortunately the odds are against you. The enemy is pretty damn tough. Hit the main viral colony and it'll divide into a sub-colony, strike again and it'll shrink down into a creeping crawling amoebic sliver. Ugh. The graphics are very good indeed, with the globular amoebas being convincingly depicted, and the sound, while modestly used, is quite effective. There's no 'hyperspace' facility (or equivalent) but you're blessed with a very handy trio of shields and two shooting styles.

Purists may well blanch, but I rather prefer this 'medical' ***Asteroids*** to the official Atari conversion. There's no garish colours to contend with . . . just very heavy action. Neat stuff. —*S.K.*

Game: SUICIDE MISSION
Maker: STARPATH CORPORATION
Machine: VCS + STARPATH SUPERCHARGER
Format: cassette
Price: £9.95
Rating: KKK



HE OVERDID THE SPINACH

Game: POPEYE
Maker: PARKER
Machine: COLECOVISION + INTELLIVISION*
Format: ROM
Price: £34.50 each
Rating: KKK(*Now also out for Philips Videopac system, 34.50)

"Well blow me down, Olive. What kind of a mesk has I gots meself inta this time?" The answer, Popeye, old cartoon chum, is a pretty neat video game, based on a hit arade game.

Those of us with long enough memories can remember "Popeye" as one of the best animated cartoon shows on TV (and I'm talking about the TV showings of the original 1940's cartoons, not the banal modern dross that still appears). That quality of animation was a feature of the arcade game and, thankfully, has not lost much in translation to the video game medium.

The game has Kong-like overtones in that Olive, at the top of the screen, is throwing down hearts, notes and cries for H-E-L-P which Popeye has to catch before they fall into the sea at the bottom. He does this by racing along platforms at various levels, connected by stairs, ladders, etc.

Bluto (the stupid instruction manual insists on calling him 'Brutus') constantly chases after Popeye trying to knock him off the platforms into the sea. The Sea Hag appears occasionally to hurl bottles which Popeye has to punch out of the way or be knocked off his feet. Vultures have to be tackled in a similar way.

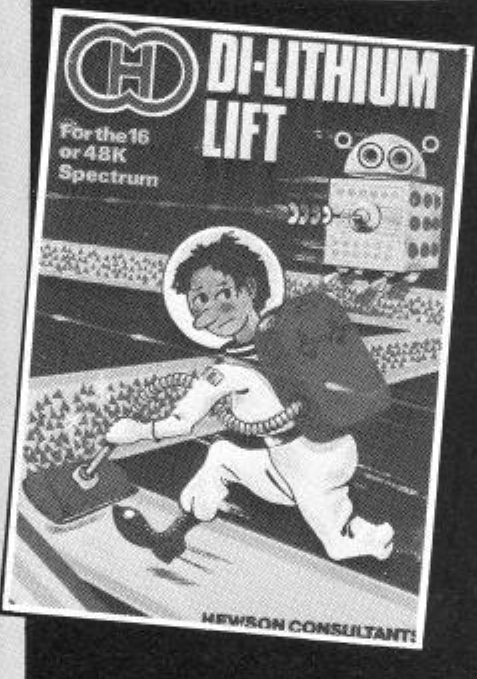
Popeye, of course, has his faithful can of spinach which he can chomp and gain several seconds of Bluto-socking power, plus a few other tricks up his sleeve.

The whole game takes place over three different, beautifully rendered screens and has more features than you could shake a Goon at and which make it very addictive.

Of the two versions out from Parker so far, the ColecoVision edition comes closest to the arcade original. Bluto, especially, is excellently characterised. Coleco's sound system is more than up to the task of belting out "I'm Popeye the Sailor Man" whenever our one-eyed hero downs a can of spinach.

Intellivision owners won't be disappointed with their version either. It's colourful and fast (would be more if not for those notorious control discs).

Great game. Highly addictive. Don't pass it up. — R.B.



GRIDSTROLLER BLUES

Sounds very scientific. But, like Ocean's rather more playable ***Transversion****, this swipes the design idea of* ***Gridrunner*** *and adds different mechanics.*

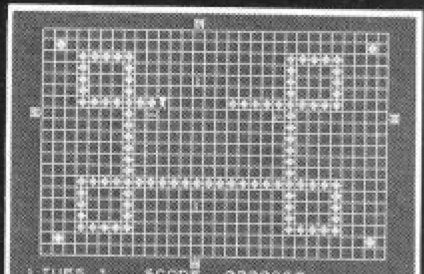
Ignoring the low-budget Moorcock-style synopsis that adorns one of Hewson's usual awful packages, your fingers control a small fellow who zips over a variety of patterned grids collecting crystals and (you hope) dodging the droid cannons that guess your next move with alarming accuracy.

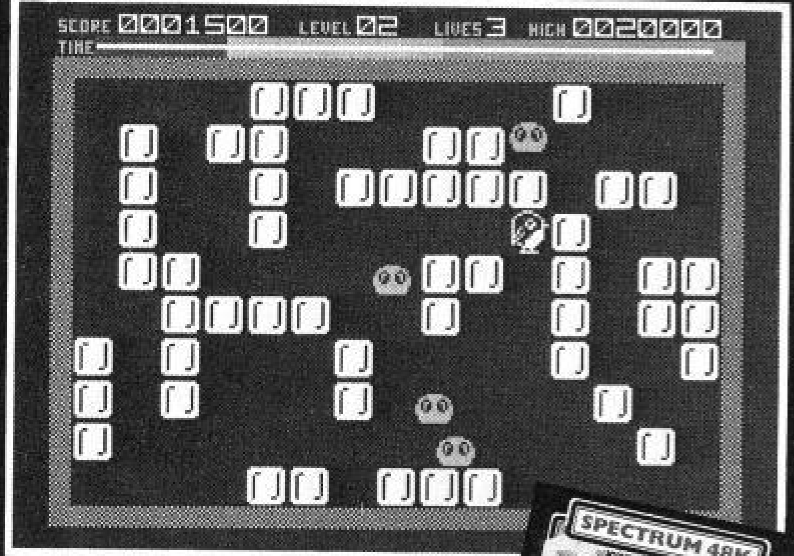
In fact, so astute is the opposition here that it took superhuman efforts to get to even the second screen. Not only are there some weird fluctuations in speed, there's a time limit on each of four brutish and short lives.

Bland graphics offer a functional display. The flashing bonus crystals are almost impossible to score off, and the whole game — playable really only with a joystick — is very difficult, offering little incentive to become more expert.

Addictive in a pointless way. Piffling sound and a hall of fame are minor extras. —R.C.

Game: DI-LITHIUM LIFT
Maker: HEWSON CONSULTANTS
Machine: SPECTRUM
Format: cassette
Price: £7.95
Rating: K







BRASS MONKEY TIME

Game: ESKIMO EDDIE
Maker: OCEAN
Machine: SPECTRUM 48K
Format: cassette
Price: £5.90
Rating: K

Ocean are particularly good at honing arcade originals to polished Spectrum programmes — their *Kong* and *Hunchback* are about the best of their type — and *Eskimo Eddie* is a skilful metamorphosis of *Pengo* into a playable small-scale version.

There's a kind of 'preliminary run' to pass through before the main part of the game: you send Eddie past ice floes and polar bears to pick up the penguin, a rescue which has to be effected three times before moving to the game proper.

This is actually a dubious bonus, for it's tedious to have to go through this unexciting stage each time a life is lost. But the bears at least are beautifully animated.

As for the rest, it is to my mind based on a singularly obtuse and brainless original — for some reason *Eskimo Eddie's* rather shapeless monsters always seem especially bland — and a glossy layout merely masks action which is smooth but eventually uninvolving.

A perky use of the computer's limited sound and a general attention to detail hallmark the craftsmanship by which Ocean has commendably stuck by, and it must be admitted that this is the best *Pengo* version around. — **R.C.**

AS PI'D AS A NEWT



Any program with a message that reads "You naughty Pi-Man! I'm going to have to take away ten points!" is obviously in trouible, but this is even more solidly feeble than that legend suggests.

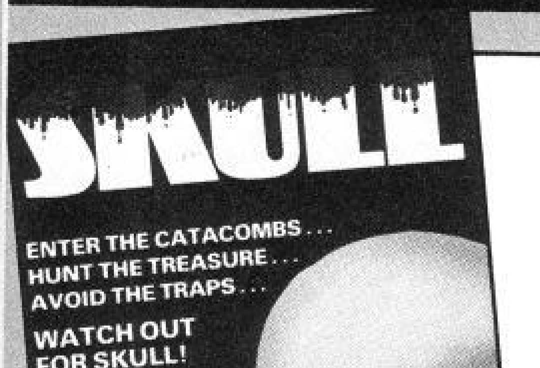
Automata's unloveable Pi-Man stumbles down a high street full of traffic and into as many pubs as you can direct him, where he has to manoeuvre between pool players, crisp packets and other drinkers in order to slurp down all the pints on the bar (actually they disappear with a ping). Then he totters from the saloon back on the street and does it all again. And again. This is a pub crawl without end.

You start off with 1000 points and these are removed — penalties for barging into other soaks, stepping in bar slops etc — until you're down to zero, when you're told how many jars Pi-Man has managed to consume.

It's well animated in a modest sort of way but the precept of the game is (according to taste) either pernicious or merely coy. It certainly isn't much fun to play and is rather unresponsive on the keyboard. — R.C.

Game: PI-EYED
Maker: AUTOMATA
Machine: SPECTRUM 48K
Format: cassette
Price: £6.00
Rating: K





Dem Bones Dem Bones

Just goes to show that there's still life in an old idea treated right. *Skull* is your basic 3D maze game but gussied up with a whole lot of glossy touches that make it more than halfway decent.

Game object is to negotiate an infinite-level maze collecting treasure without losing lives, so racking up the highest score possible. Out to stop you doing this are all manner of hazards; pitfalls, trapdoors, portcullises and, of course, skulls.

These giant, creepy effigies (rendered in superb hi-res graphics) lurk round corners and will suddenly appear in your path. If you hold one or more crosses the skulls will have gems set in their eye socket and you can obtain these by ploughing through the skull. But beware the skull with the empty eyes ... confronting it will bring your quest to a swift and bloody end.

What sets *Skull* head and shoulders above other 3D mazes is the attention to detail Games Machine have lavished on the game. Like the plan view of the whole maze that appears on screen at the start of each game, showing where the treasure lies and the skulls lurk, only to frustratingly disintegrate before your eyes after a few seconds. It can be called back again at any time but will cost you 25 points.

Other noteworthy features include save and load facilities, printing out of screen images and a unique option to 'merge' high score tables.

Graphically *Skull* is very slick. 100% machine code. Random maze generation. Stunning screen wipes. The whole presentation smacks of professionalism. (Other software houses please note.)

A very credible first effort from Games Machine and hopefully a mark of the standard we can expect from future releases. — R.B.

Game: SKULL
Maker: GAMES MACHINE
Machine: SPECTRUM 48K
Format: cassette
Price: £6.95
Rating: KK

AMPHIBIOPHOBIA

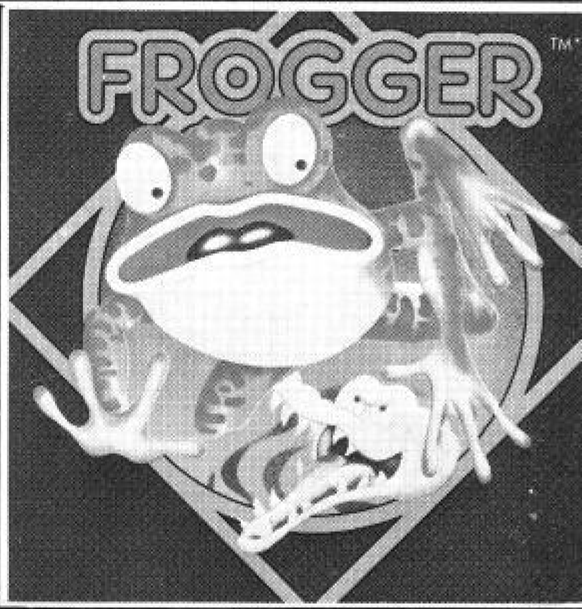
'mon everybody — let's get ut there and squash those ogs! We'll show those Egyp- ans that 20th Century video amers know how to handle lagues of frogs! Plagues? Well, seems that way with Parker onverting their arcade super- tar to every video game and omputer system imaginable.

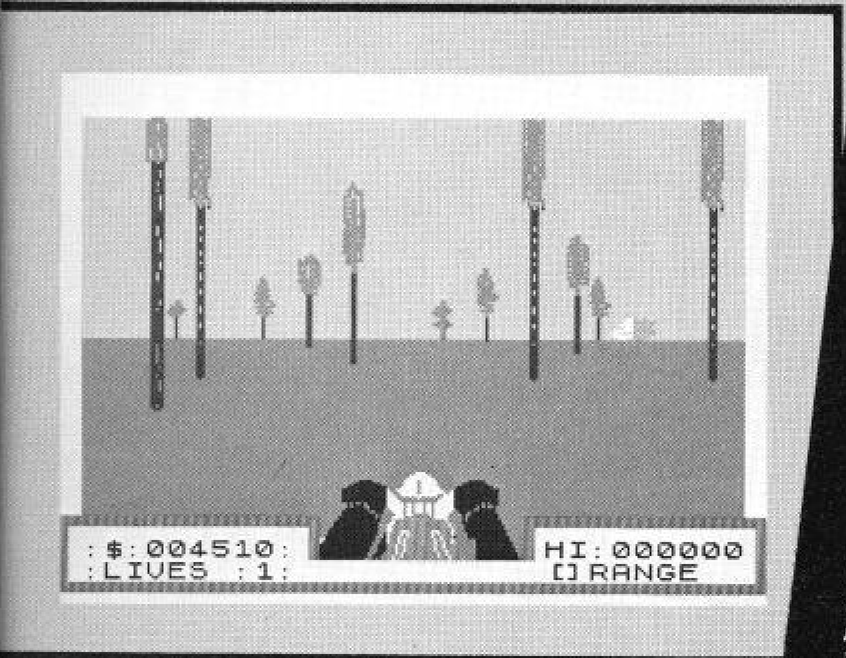
ColecoVision and Atari Home omputer owners are the latest roups to get versions of the ame-that-spawned-a- housand-tadpoles. *Frogger*, or those of you who've been acationing in Belgium for the last 2 years, involves stopping frogs getting across a road and a river to safety by running them under as many vehicles as possible.

Of the two versions on offer here, the ColecoVision *Frogger* takes the trophy. Excellent sound, graphics and colour combine to make great game-play that is only let down by the system's naff hand controllers. Extra touches include creepy looking snakes and a most pleasing effect whenever a frog gets trashed in the road. (I hate frogs — had you noticed?)

Game: FROGGER
Maker: PARKER
Machine: COLECOVISION + ATARI HOME COMPUTER
Format: ROM
Price: £29.95 each
Rating: KKK

Atari's edition is also graphically good and has the edge in the sound department. Game action is great and benefits from the large variety of joystick controllers that can fit the Atari system. — R.B.





VROOM!

Game: 3D DEATH CHASE
Maker: MICROMEGA
Machine: SPECTRUM
Format: cassette
Price: £6.95
Rating: KKK

This is that rarity, an excellent and simple idea brilliantly executed. It seems to have grown out of the jetbike chase in Return Of The Jedi *and summons a similarly pulversing rush of excitement.*

The player controls a mean machine of which only a pair of gripped handlebars are visible onscreen.

The mission is to pursue and destroy a couple of renegade bikers who come into view on acceleration. The chase is conducted over terrain that becomes progressively more densely wooded until, by screen five (of eight), it's as hard dodging the trees as it is blasting the quarry.

On the early screens a distant chopper takes off and lands to provide a difficult extra target; on later ones a tank lumbers ponderously along the horizon. Darkness sometimes provides a further hazard.

The pace is so fast, the addiction so poisonous, that one scarcely notices how well animated the bikes are and the shower of shrapnel that follows every explosion. Hitting a tree yourself provides a red-out of proportions that make you flinch with pain.

Easily picked up, the game gets ferociously demanding at its top levels, but no complaints on any score. This is one of the few programs to translate arcade fury directly to the Spectrum. Absolutely outstanding.
— R.C.

These pics no feelthy

Come wiz me to ze Casba. No? Well, it sounds a bit more inviting than 'take a trample through the tomb', which more accurately describes ***Tutankham****.*

The theme: familiar maze game. The scene: King Tut's tomb. The task: plunder the tomb of its treasures, find keys to unlock the doors between levels. Your role: a gun-totin' archeologist. The opposition: various scorpions, cobras, bats and ancient Egyptian supernatural creatures. Your defences: one hand pistol firing left and right only plus a devasting but very limited 'laser flash' that can clear every creature off the screen with one blast.

The object, then, is to survive as long as possible. Not easy when creatures pour forth from 'nests' and pursue you with an almost religious fanaticism.

You must get the key in each section in order to get to the next level; everything else in the way of treasure is pure bonus and can be ignored if need be — like when you have to bolt for the exit chased by a horde of hell-spawned weirdos. There are secret passages to get you from one place to another quickly but these must be used judiciously.

Tutankham *currently comes in three versions for the video gamer. The Coleco edition wins hands down for graphics, sound and action. The playfield is superbly detailed and the creatures look real mean. Intellivision has good graphics but is painfully slow and has lousy response from the controllers. Atari comes off worst in the graphics department but makes up for it with good sound and incredible speed. This one needs razor-sharp reflexes. It is also the only one of the three to scroll vertically rather than horizontally.*

Whatever system you have, may the curse of Tut never warp your circuit board. — **R.B.**

Game: TUTANKHAM
Maker: PARKER VIDEO GAMES
Machine: ATARI VCS, INTELLIVISION, COLECOVISION
Format: ROM
Price: £34.95 or less each
Rating: KKK

ZX'49

Stop the presses! Hold the front page! Hi-res graphics on the ZX81 without any additional hardware! Oh gosh, oh wow. Like truly awsome, man!

Seen on any other micro *Forty Niner* probably wouldn't excite much comment but what we have here seems to be a genuine break-through in games software for the venerable ZX81.

Forty Niner is your basic digging game where you, a miner, are tunnelling about for gold nuggets. Giant rats are on your tail threatening each of your three lives. You have two main weapons in your arsenal. You can cause small cave-ins to block their path or run over a snake's nest, releasing it to get the rats (a game where snakes are on your side, whatever next?). Meanwhile, on the surface a nasty Gremlin is gradually working his way towards your tunnel entrance. If he gets into the mine you're finished!

Collect enough nuggets and an entrance opens to the next, harder level.

What is, of course amazing is that the whole game appears on screen with graphics that wouldn't disgrace the Spectrum. All the elements of the game are rendered in detailed, recognisable shapes and move in relatively smooth, flicker-free action. The rats scurry, the snakes squirm and the miner runs and climbs. You almost expect colour and sound as a matter of course!

Control is, well, all you can expect from ZX81 keyboard. But you can re-define your own control keys. — **R.B.**

Game: FORTY NINER
Maker: SOFTWARE FARM
Machine: ZX81
Format: cassette
Price: £5.95
Rating: KK

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y isn't
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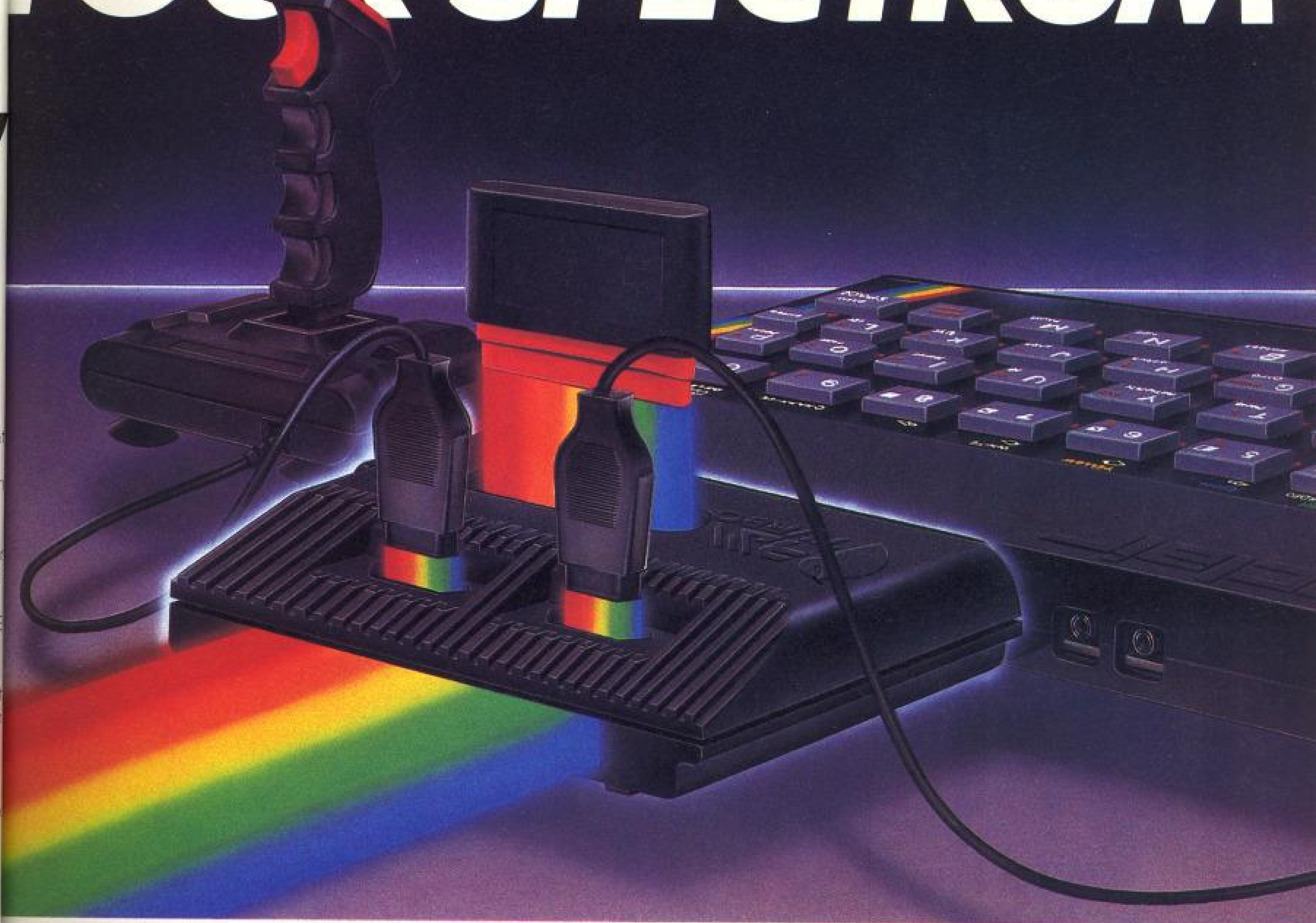
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'BIG K'

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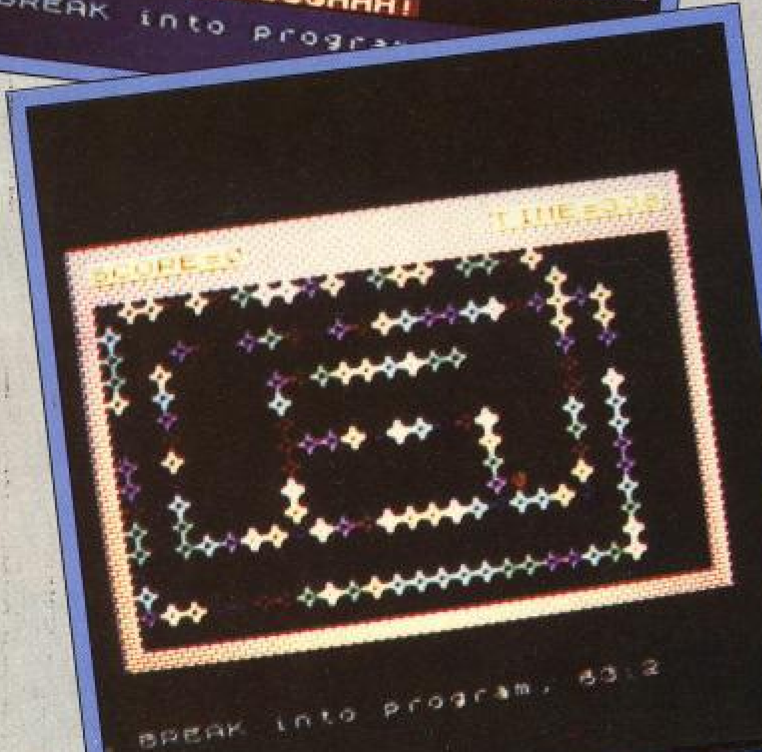


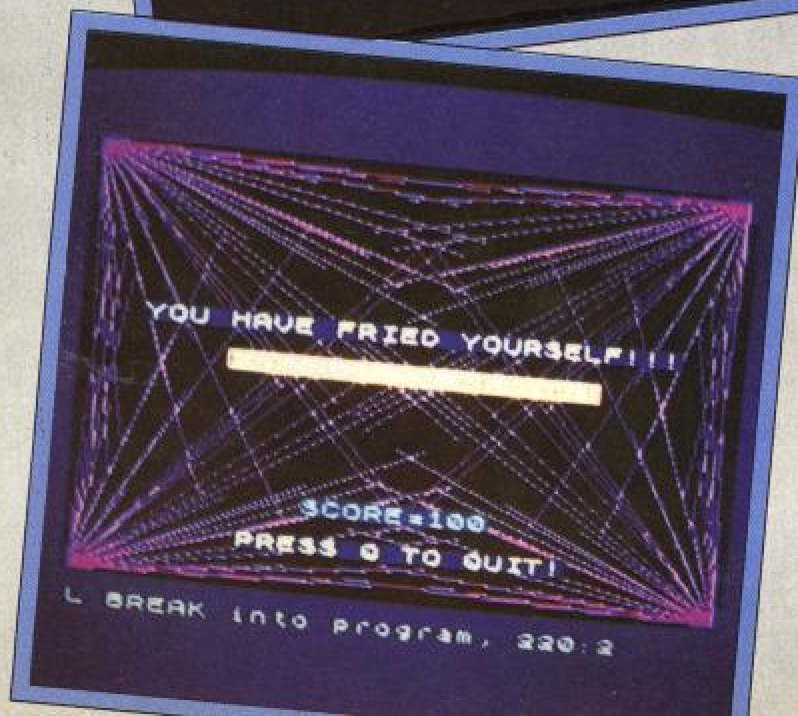
EGBERT

Guide Egbert, the Silicon Snake, around the room and munch everything you can. Warning: Egbert moves VERY fast. Second Warning: touch your own tail or the walls of the room and you FRY. Slither on!

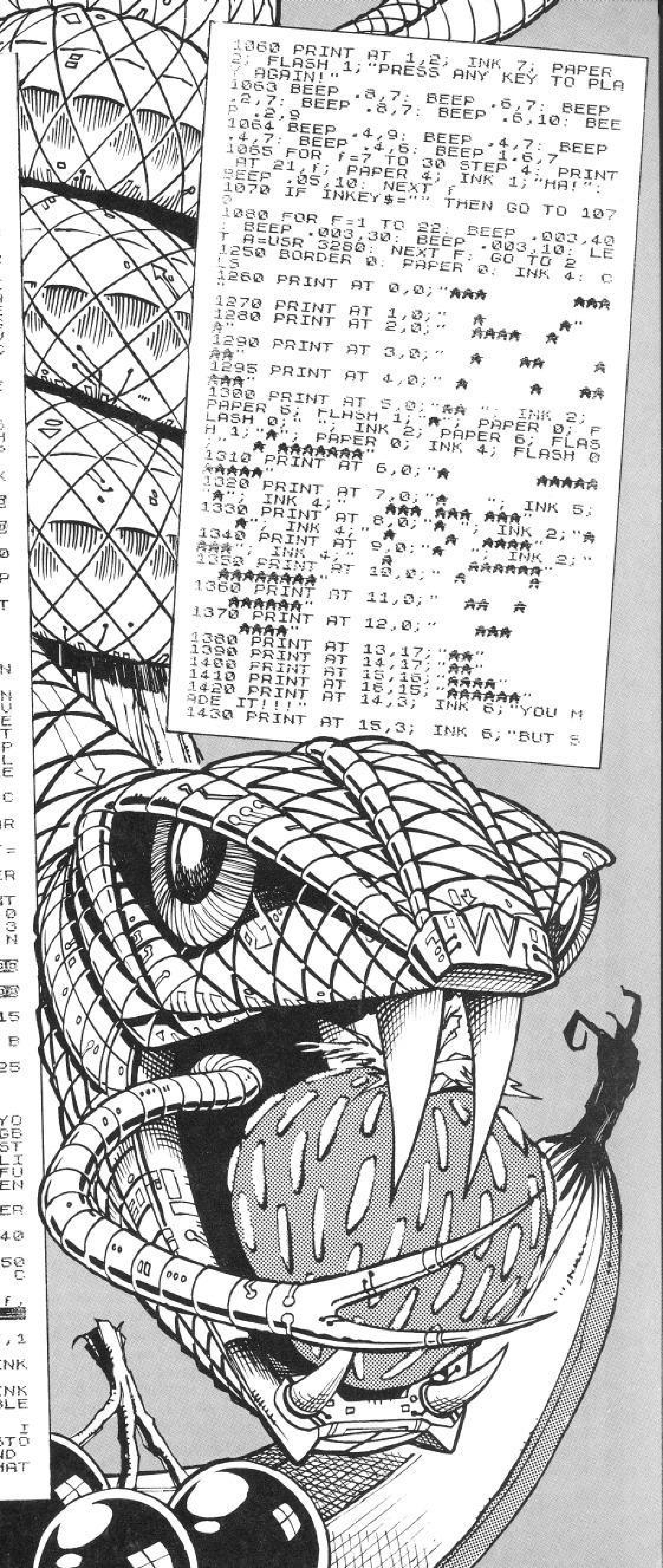
By STEVEN BARCLAY for SPECTRUM







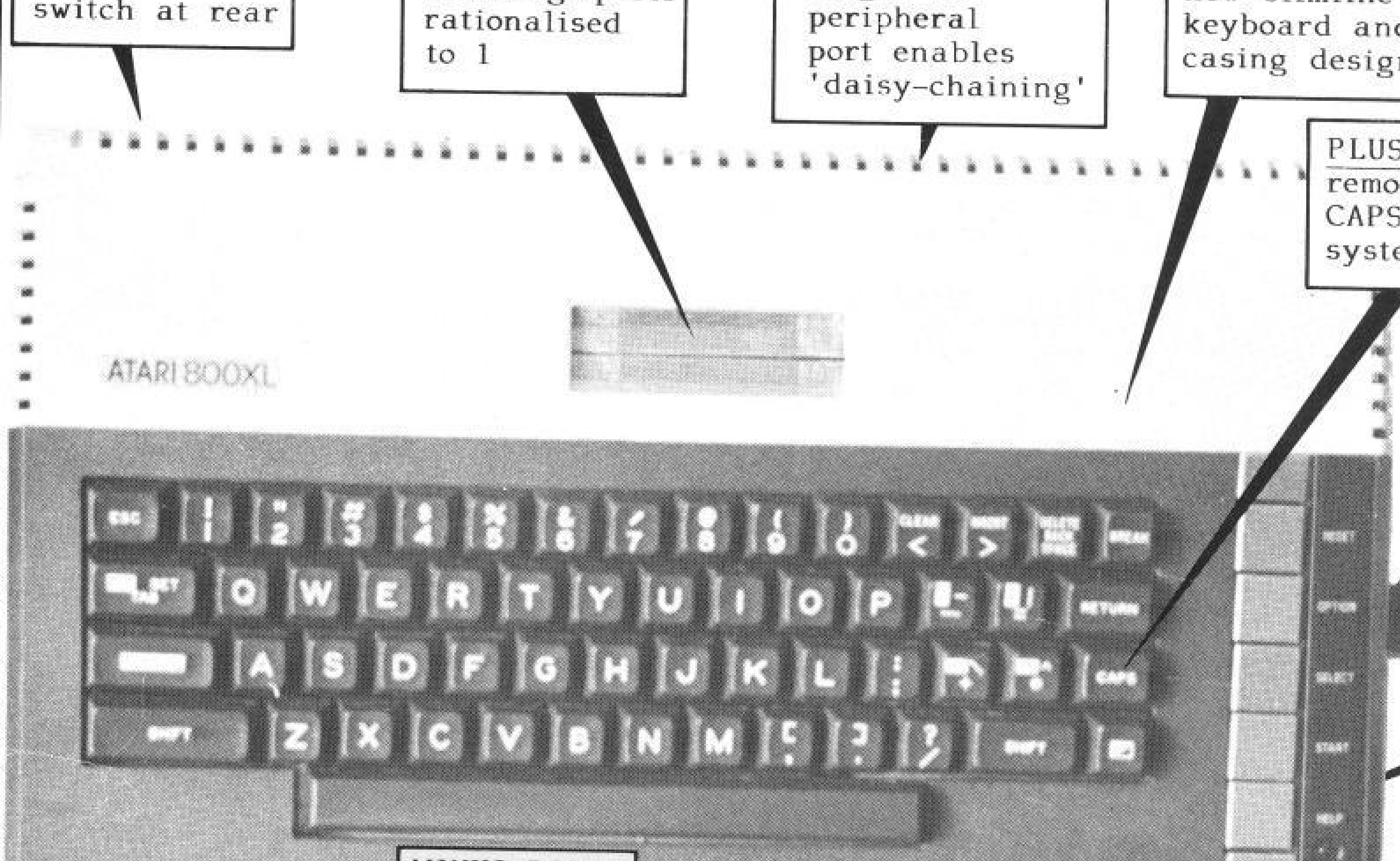

```
   1 GO SUB 7000: GO SUB 3000
   2 CLS : LET sc=0
   3 GO SUB 300
   4 PAPER 0: BORDER 0: CLS
  10 LET a=10: LET b=10
  20 PRINT AT 10,8; INK 4; PAPER
 1; FLASH 1;"PREPARE TO DIE!": F
OR O=1 TO 5: FOR F=1 TO 5: BEEP
1/20,F: NEXT F: NEXT O: CLS
  21 LET T=500
  30 PRINT AT 2,2; INK 2; PAPER
7;"▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒"
  31 PRINT AT 19,2; INK 2; PAPER
 7;"▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒
"
  32 PRINT AT 0,2; INK 2; PAPER
7;"▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒"
  33 PRINT AT 1,2; INK 2; PAPER
7;"▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒"
  34 LET M=19: FOR F=2 TO 10: PR
INT AT F,29; PAPER 7; INK 2;"▒"
  35 PRINT AT F,2; INK 2; PAPER
7;"▒": BEEP 1/25,F
  36 PRINT AT M,29; PAPER 7; INK
 2;"▒"
  37 PRINT AT M,2; INK 2; PAPER
7;"▒": BEEP 1/25,F: LET M=M-1: N
EXT F
  40 LET q=INT (RND*16+2)+1
  41 LET w=INT (RND*25+2)+1
  42 LET S=INT (RND*10)+1
  43 IF S=1 THEN LET O$="●": LET
 INK=4
  44 IF S=2 THEN LET O$="▼": LET
 INK=6
  45 IF S=3 THEN LET O$="↖": LET
 INK=5
  46 IF S=4 THEN LET O$="♣": LET
 INK=2
  47 GO SUB 6000
  48 LET move=1
  49 PRINT AT 1,2; PAPER 7; INK
2;"▒"; INK 2; PAPER 6;"SCORE=";s
c: PRINT AT 1,29; PAPER 7; INK 2
;"▒": BEEP 1/5,5: BEEP 1/5,5: BE
EP 1/5,5: BEEP 1/7,7: BEEP 1/7,7
: BEEP 1/7,10: BEEP 1/5,5
  50 IF INKEY$="P" OR INKEY$="p"
 THEN LET move=1
  51 IF INKEY$="L" OR INKEY$="l"
 THEN LET move=2
  52 IF INKEY$="Z" OR INKEY$="z"
 THEN LET move=3
  54 IF INKEY$="X" OR INKEY$="x"
 THEN LET move=4
  60 IF move=1 THEN LET a=a-1
  61 IF move=2 THEN LET a=a+1
  62 IF move=3 THEN LET b=b-1
  63 IF move=4 THEN LET b=b+1
  71 PRINT AT a,b; INK INT (RND*
7)+1;"✦"
  75 PRINT AT 1,21; INK 2; PAPER
 6;"TIME=";T; PAPER 7; INK 2;"▒"
  80 PRINT AT q,w; INK INK;O$
  81 IF a=q AND b=w THEN LET sc=
sc+100: BEEP .09,50: BEEP .09,40
: BEEP .09,30: BEEP .15,50: FOR
f=3 TO 18: BEEP 1/100,10: BEEP .
01,-25: PRINT AT f,3; PAPER 0;"
                          ": NEXT
 f: GO TO 40
  90 IF a=2 OR a=19 OR b=2 OR b=
29 THEN GO TO 200
  95 LET T=T-1
  96 IF T<0 THEN GO TO 1000
 100 GO TO 50
 200 PRINT AT 21,10; INK 6; PAPE
R 2;"AAAGGGHHH!": FOR f=-20 TO 3
0: BORDER 1: BEEP 1/80,f: BORDER
 5: BEEP 1/120,f: BORDER 0: BEEP
 1/150,f: NEXT f
 202 FOR F=0 TO 22: LET A=USR 32
80: BEEP 1/50,F: NEXT F
 205 BORDER 1: FOR F=1 TO 20: PA
PER 6: CLS : PAPER 2: CLS : NEXT
 F: PAPER 0: CLS : LET j=INT (RN
D*6)+1
 210 PRINT AT 8,3; PAPER 1; INK
6;"YOU HAVE FRIED YOURSELF!!!"
 220 LET a=INT (RND*150)+1: LET
b=INT (RND*150)+1
 230 INK j: PLOT 0,0: DRAW a,b
 231 PLOT 255,0: DRAW -a,b
```



```
232 PLOT 255,175: DRAW -a,-b
233 PLOT 0,175: DRAW a,-b
240 PRINT AT 10,7; INK 2; PAPER
6;"PRESS S TO RESTART"
241 PRINT AT 19,8; INK 6; PAPER
1;"PRESS Q TO QUIT!"
250 PRINT AT 17,11; INK 1; PAPE
R 5; FLASH 1;"SCORE=";sc
260 IF INKEY$="S" OR INKEY$="s"
THEN GO TO 2
261 IF INKEY$="Q" OR INKEY$="q"
THEN GO TO 4000
270 GO TO 210
300 PAPER 1: BORDER 2: INK 5: C
LS
330 PRINT AT 2,12; INK 2; PAPER
6; FLASH 1;"EGBERT!"
335 PRINT AT 4,3;"GUIDE YOUR SI
LICON SNAKE          (EGBERT) TOWA
RDS THE FOOD         LAYING ON THE
 FLOOR.              EGBERT WILL G
IVE YOU 100          POINTS FOR EV
ERY PIECE            OF FOOD YOU C
AN LAY HIS           FACE IN!"
 340 PRINT AT 12,3;"STEER CLEAR
OF THE WALLS         FOR THEY ARE
 NOT EXACTLY         COLD,INDEED
THEY HAVE BEEN       KNOWN TO BE
RATHER WARM AT       TIMES,UNLESS
 THE THOUGHT OF      BEING SCORCH
ED OUT OF            EXISTANCE AP
PEALS TO YOU!"
 350 PRINT AT 20,3; PAPER 6; INK
 1;"PRESS ANY KEY TO CONTINUE"
 355 PRINT AT 21,0;"▦▦▦▦▦▦▦▦▦▦▦
▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦"
 356 PRINT AT 0,0;"▦▦▦▦▦▦▦▦▦▦▦▦
▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦"
 360 FOR F=0 TO 21: PRINT AT F,0
;"▦";AT F,31;"▦": BEEP .003,50:
BEEP .003,40: BEEP .003,30: BEEP
 .003,20: BEEP .003,10: NEXT F
 365 IF NOT INKEY$<>"" THEN GO T
O 365
 367 BEEP 1/5,5: BEEP 1/5,10
 370 PAPER 0: BORDER 0: CLS
 375 PRINT AT 2,3; INK 4;"THERE
IS A TIME LIMIT          TICKIN
G AWAY IN THE TOP        RIGHT
HAND CORNER OF THE       SCREEN
 DURING THE GAME,        SURVIV
E UNTIL THIS             REACHE
S 0 AND,PROVIDING        EGBERT
 HAS BEEN WELL FED       (30+ P
IECES OF FOOD),          MARVEL
 AT WHAT YOU SEE         BEFORE
 YOU!"
 380 PRINT AT 13,3; INK 6;"THE C
ONTROLS ARE AS FOLLOWS:"
 385 PRINT AT 15,3; INK 6;"UPWAR
DS=P          DOWNWARDS=L
                         LEFT=
Z          RIGHT=X"
 390 PRINT AT 20,3; INK 1; PAPER
 6;"PRESS ANY KEY TO CONTINUE"
 400 INK 2: FOR F=0 TO 21: PRINT
 AT F,0;"▦";AT F,31;"▦": BEEP .0
03,50: BEEP .003,40: BEEP .003,3
0: BEEP .003,20: BEEP .003,10: N
EXT F
 405 PRINT AT 0,0; INK 2;"▦▦▦▦▦▦
▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦"
 410 PRINT AT 21,0; INK 2;"▦▦▦▦▦
▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦▦"
 415 IF INKEY$="" THEN GO TO 415
 417 BEEP 1/5,5: BEEP 1/5,10
 420 PAPER 6: BORDER 1: INK 1: B
RIGHT 1: CLS
 425 PRINT AT 5,3;"TIP": PLOT 25
,127: DRAW 20,0
 426 PLOT 25,125: DRAW 20,0
 427 PLOT 25,123: DRAW 20,0
 430 PRINT AT 10,3;"EACH TIME YO
U GET SOME             FOOD FOR EGB
ERT YOU START          AT YOUR LAST
 POSITION AND          BEGIN TO SLI
THER UPWARDS.          SO BE CAREFU
L TO MOVE DOWN         QUICKLY WHEN
 THIS HAPPENS!"
 435 PRINT AT 20,5; INK 6; PAPER
 2;"PRESS ANY KEY TO PLAY"
 440 IF INKEY$="" THEN GO TO 440
 450 RETURN
1000 IF sc<=3000 THEN GO TO 1250
1010 PAPER 1: BORDER 2: INK 4: C
LS
1020 FOR f=14 TO 21: PRINT AT f,
0;"████████████████████████████
███": NEXT f
1030 FOR F=6 TO 13: PRINT AT F,1
5; INK 6;"█": NEXT F
1040 PRINT AT 8,13; PAPER 6; INK
 0;"R.I.P"
1050 PRINT AT 15,1; PAPER 4; INK
 0;"UNFORTUNATLY YOU WERE UNABLE
  TO SUPPLY EGBERT WITH A
  SUFFICIENT AMOUNT OF FOOD. I
N EGBERTS FRUSTRATION HE MISTO
OK YOU FOR A SALTED PEANUT AND
  INSTANTLY DEVOURED YOU! WHAT
A  SHAME!"
```

```
1060 PRINT AT 1,2; INK 7; PAPER
2; FLASH 1;"PRESS ANY KEY TO PLA
Y AGAIN!"
1063 BEEP .8,7: BEEP .6,7: BEEP
.2,7: BEEP .8,7: BEEP .6,10: BEE
P .2,9
1064 BEEP .4,9: BEEP .4,7: BEEP
.4,7: BEEP .4,6: BEEP 1.6,7
1065 FOR f=7 TO 30 STEP 4: PRINT
 AT 21,f; PAPER 4; INK 1;"HA!":
BEEP .05,10: NEXT f
1070 IF INKEY$="" THEN GO TO 107
0
1080 FOR F=1 TO 22: BEEP .003,40
: BEEP .003,30: BEEP .003,10: LE
T A=USR 3280: NEXT F: GO TO 2
1250 BORDER 0: PAPER 0: INK 4: C
LS
1260 PRINT AT 0,0;"***            ***"
1270 PRINT AT 1,0;"
1280 PRINT AT 2,0;"  *  ****  *"
*"
1290 PRINT AT 3,0;"    *   **    *
**"
1295 PRINT AT 4,0;"  *     *     **
***"
1300 PRINT AT 5,0;"** "; INK 2;
PAPER 6; FLASH 1;"*"; PAPER 0; F
LASH 0;" "; INK 2; PAPER 6; FLAS
H 1;"*"; PAPER 0; INK 4; FLASH 0
;"*  *******"
1310 PRINT AT 6,0;"*          *****
*****"
1320 PRINT AT 7,0;"*          "; INK 5;
"*"; INK 4;" *** *** ***"
1330 PRINT AT 8,0;"  "; INK 2;"*
*"; INK 4;" *    "; INK 2;"*
1340 PRINT AT 9,0;"*   "; INK 2;"
***"; INK 4;" ******"
1350 PRINT AT 10,0;" *   *
 ********"
1360 PRINT AT 11,0;"   ** *
 ******"
1370 PRINT AT 12,0;"   ***
 ****"
1380 PRINT AT 13,17;"**"
1390 PRINT AT 14,17;"**"
1400 PRINT AT 15,16;"****"
1410 PRINT AT 16,15;"******"
1420 PRINT AT 14,3; INK 6;"YOU M
ADE IT!!!"
1430 PRINT AT 15,3; INK 6;"BUT S
```

DARK HORSE or LAST



The sleek 800XL is the latest machine to be launched by a company which, years ago, became a legend in its own lunchtime. Is it the right product too late? TONY TYLER reviews . . .

THE ATARI 800XL computer is the natural successor to the chunky, tough 800 which has served the company so well for so long. As the medium-range model in the all-new XL series — with the 600 (16K) and the 1450XLD at either extreme — it lines up naturally against the CBM 64/Electron price bracket. Actual cost: £249.99.

What do you get for the money? More importantly, how does it compare with its immediate ancestor?

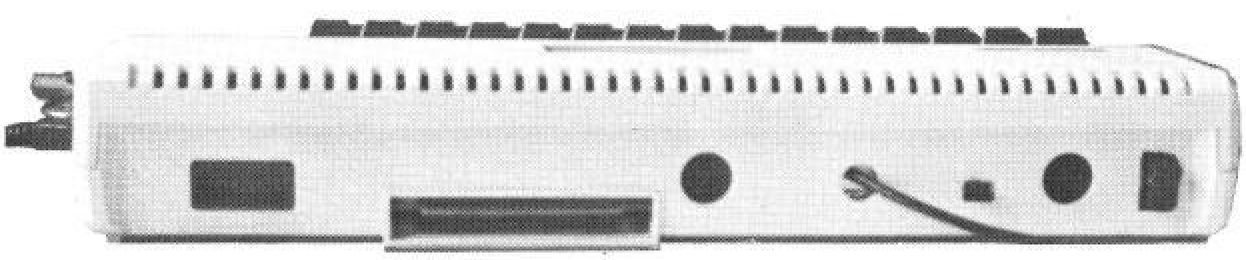
To begin with, the case has been slimmed down, and various little items have been tidied up. There is no longer any second cartridge slot; more importantly, the Atari BASIC is built-in to the machine, obviating the need for the original BASIC ROM cart. Joystick ports are reduced from four to two, and moved from the front to the side of the machine. The power switch is now at the back, along with the remaining peripheral ports.

The keyboard has been changed in various subtle and pleasing ways. The Atari logo key remains, but is relabelled with an anonymous graphic (this key is used for shifting into and out of inverse video). More importantly, the caps/lowercase system of the old 400/800 series has been scrapped; the new arrangement resembles the BBC arrangement — though an LED to show when caps lock is on would have been a good idea. Otherwise the touch is light, sensitive and positive, with the keys falling nicely under the hand.

The much publicised HELP key is, of course, merely an addition to the row of function keys; these, in brushed aluminium, are arranged vertically down the right hand side replacing the old yellow plastic gobstoppers of yore. There are now four such keys, all of which can be programmed via a PEEK (53279) to achieve effects desired.

So much for externals. Internally the circuitry has been re-designed, though it still owes most of its structure to the earlier (800) chip choice and layout. Most evident change is in the size of the ROM, which is now considerably larger in order to accommodate the BASIC — though why Atari had to go and throw

STGASP?



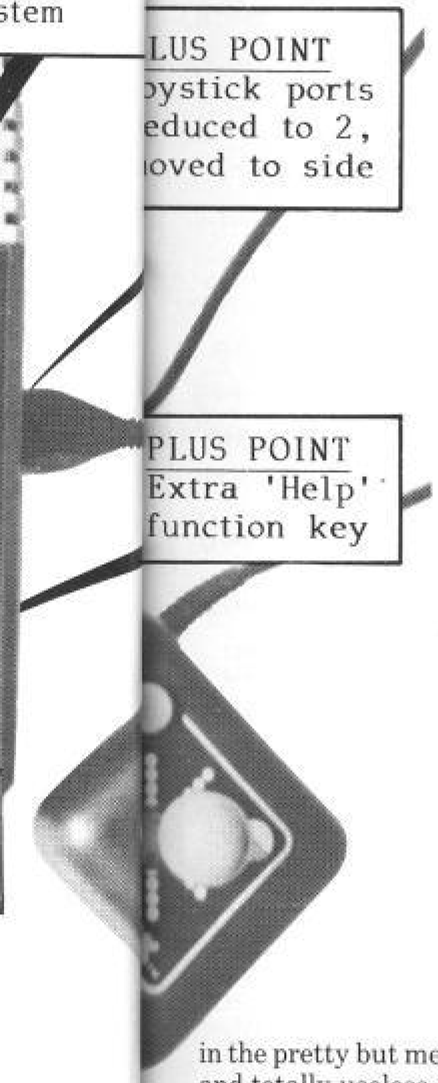
The functional and tidy rear end. Of the Atari 800XL

tari 800XL Technical Specification

ame: 800XL
laker: Atari
lemory: 64K (37 available in free RAM)
Colours: up to 256
Sound: five octaves, four channels
Price: £249.99

e
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US POIN
nodelled
PS LOCK
stem



LUS POINT
oystick ports
educed to 2,
oved to side

PLUS POINT
Extra 'Help'
function key

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such
pro-
3279)
d.
s. In-
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com-
ough
hrow

in the pretty but meaningless and totally useless 'Self-Test' facility beats me. In fact, although the machine is advertised as possessing — and in theory possesses — 64 Big K's of memory, what you get from typing PRINT FRE(0) is 37 and a half.

Generally speaking — as a dedicated 800 user — the operating system *does* have a different feel. The RESET key (actually a 'warm start', non-destructive facility) takes slightly longer to do its stuff; the SOUND statements produce slightly different effects (a different sound chip?); and the colours are more apt to bleed — not up to snuff by 800 standards. Example: a pure white (address 14) block in the middle of a rich blue background turned out yellowy-pink. Not as precise as Atari have accustomed us to expect.

Carping criticisms over, this is really an excellent machine; and for games writers, I have to say (personal opinion) it's the best. 256 colours fill the largest palette in micro-dom. In the GTIA chip modes — 9 through 15 — up to 16 can be placed on the screen in any combination. The excellent Atari Player-Missile graphics are unchanged. I could only wish they'd seized the opportunity to clean up the BASIC.

Standard

Tread carefully here. Atari BASIC is nowhere near as unfriendly as Commodore's version. With its American spelling (COLOR, etc), and its abundance of POKEs and PEEKs, and its hash-marked device numbers, it looks like what it is: standard U.S. grade two Microsoft, neither remarkably horrible nor particularly useful. Color, sorry colour, is easily accessible either through SETCOLOR parameters or (much easier) through POKEs. SOUND parameters are definitely easier to manipulate than Commodore's or especially Acorn's (and the sound itself no whit less good in substance). But no RENUMBER? No REPEAT . . . UNTIL? None of the nuances of 'structure' which have slowly been creeping into all other BASICs (with the exception of Commodore's). Circle routines are a grisly mishmash of SIN and COS(in); Fills, in BASIC, are via the cumbersome all-purpose special XIO statement (from the top down, with only certain shapes being acceptable). Mind you, the screen editor is a piece of cake to use (i.e. it's unchanged), and the line interpreter whacks in with ERROR signals whenever your syntax gets everywhichway.

Existing programs for Atari computers will all run — so far as I know; though machine code programs require use of the OPTION key to load.

A particularly nice facility of the old 800 which thankfully has been retained is the use of the RESET key to get into direct mode and clear the screen without affecting the RAM. For keeping track of the state of variables during debugging this is particularly useful.

But there are some annoying things, too. Example: the 800XL runs off a new, bulkier transformer, which unfortunately has no socket — as did its predecessor — for the power supply to the dedicated cassette recorder. Nor will the original (800) transformer mate with the 800XL. Result: you now have to have a transformer *for each peripheral you use* (though I personally made use of a 6v battery with the cassette recorder's power jack sellotaped to the terminals — such is the hi-tech life we all lead). But the worst problem is the documentation.

It beats me, it really does, why Atari have had so much problem getting a decent manual together. Originally the 800 was sold with a dreary, maths-obsessed volume which was like O level BASIC boringly taught by an arithmetic teacher about to drop dead from terminal catatonia. Then they changed it (for the better) to Bill Carris' upbeat but slightly yukky replacement. The 800XL has nothing comparable to either — just a short guide in four languages and a connect-up booklet. No memory map. None of the simpler PEEKS and POKES. No colour chart. No music register. Nothing, in short, of any real use.

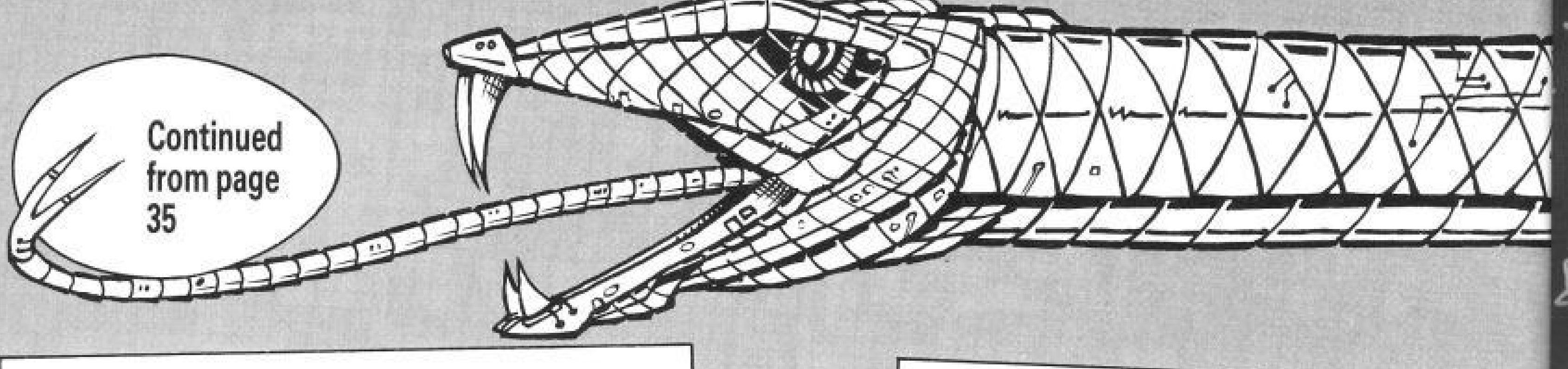
Peripherals are daisy-chained from the single output socket; this system (with 810 disc drive, cassette recorder and 1027 letter printer) worked perfectly. The i/o socket labelled 'Monitor' confusingly handles, no, not RGB output (pity), but your Commodore-style TV output. There is also a mysterious parallel bus.

'This is really an excellent machine — the best for games. I only wish they'd cleaned up the BASIC'

In conclusion: the Atari 800XL is not a vast improvement over the earlier 800; it is a slight improvement. Better styling, a better keyboard and rationalisation of the i/o ports are pluses, as is the provision of an extra function key and the built-in BASIC. Essentially it's still the same machine — but as the 800 was, and is, such an excellent micro, I'm not surprised that Atari took this decision. All in all, the integration of an outstanding design into a whole family of computers *is* an advance.

At £249.99 the 800XL is significantly pricier than its direct competition, the CBM 64 and the Electron. Is it sufficiently better than these to justify the extra bucks? Depends what you want. It is easier to program and has better colour than the 64. It has more memory than the Electron. I should say, myself, that the price is just over the top.

For all that, the 800XL is a superb micro based on tried and trusted technology and an indefatigable ancestor. Will it sell? It deserves to . . .



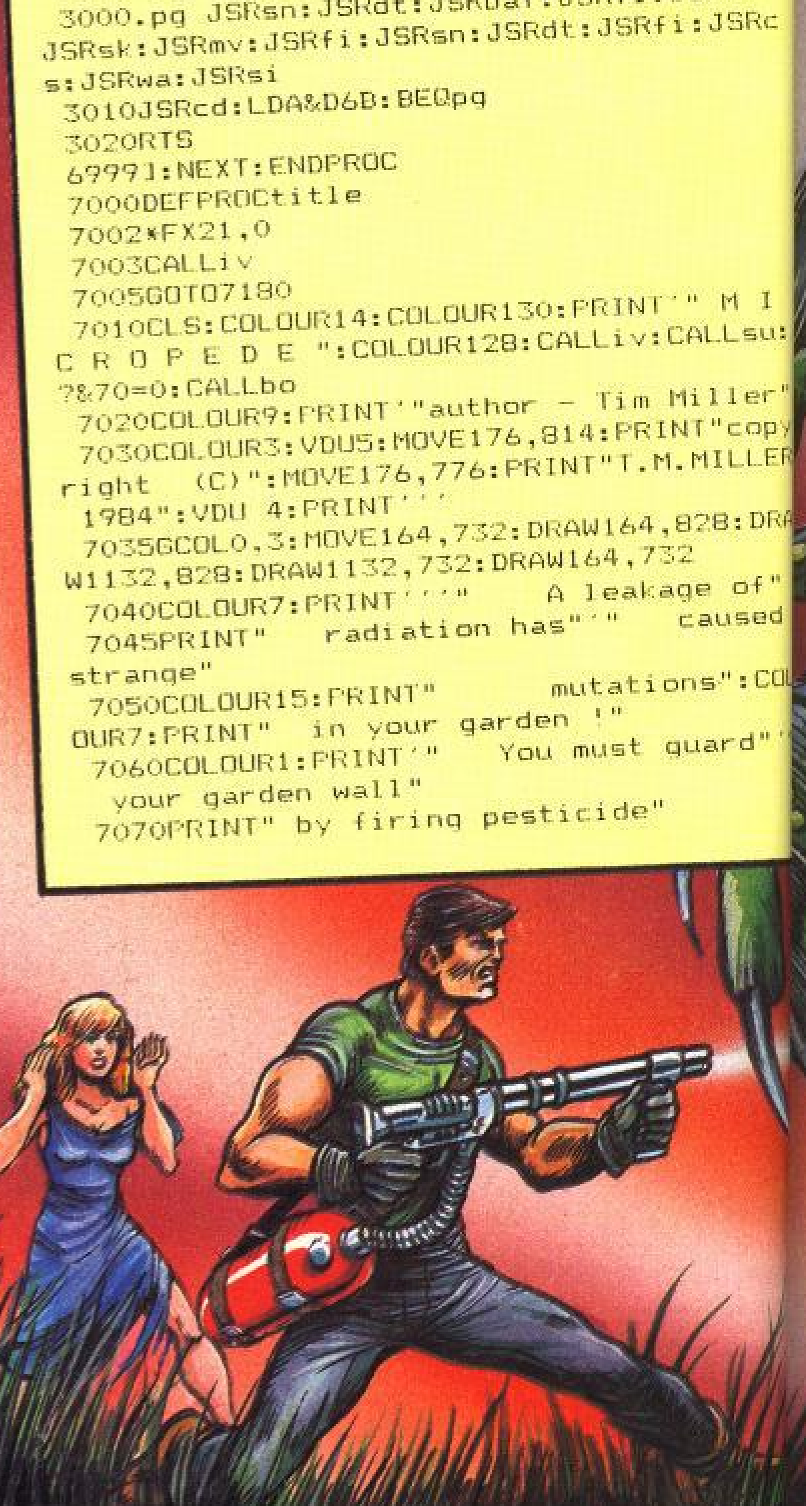
Continued from page 35

```
ADLY EGBERT IS                STILL
 UNSATISFIED                  AND C
HEWS YOU TO BITS!"
1440 PRINT AT 3,20; INK 5;"EGBER
T";AT 4,22; INK 5;"THANKS";AT 5,
25; INK 5;"YOU!"
1450 PRINT AT 10,23; INK 7;"Q TO
 QUIT"
1460 PRINT AT 12,22; INK 7;"S TO
 START"
1470 PRINT AT 20,3; INK 5;"BUT D
ON'T WORRY,YOU MADE          A VER
Y TASTY SIDE DISH!"
1475 DATA 0,3,2,3,4,3,5,5,0,6,5,
3,4,3,5,3,7,5,2,6
1476 DATA 5,3,4,3,5,3,9,3.5,7,1.
5,7,4,5,3,5,3,4,3,2.4.4,4,5,5,7
1478 FOR X=1 TO 22. READ b,a. BE
EP a/15,b: NEXT X
1480 IF INKEY$="S" OR INKEY$="s"
 THEN FOR f=0 TO 21: BEEP 1/75,1
0: LET a=USR 3280: NEXT f: GO TO
 2
1490 IF INKEY$="Q" OR INKEY$="q"
 THEN GO TO 4000
1500 GO TO 1480
3000 PAPER 0: BORDER 1: CLS : FO
R F=1 TO 100: PRINT AT 8,11; FLA
SH 1; INK 6; PAPER 2;"STOP TAPE!
"
3010 PLOT INT (RND*255)+1,INT (R
ND*174)+1: INK INT (RND*7)+1: NE
XT F
3020 PRINT AT 8,6; INK 5;"WELCOM
E TO THE WORLD"
3030 PRINT AT 10,11; INK 5;"OF E
GBERT!"
3050 INK 2: FOR F=1 TO 30: LET A
=INT (RND*25)+1: LET B=INT (RND*
25)+1
3060 PLOT 40,35: DRAW A,B
3070 PLOT 215,35: DRAW A,B
3080 PLOT 215,140: DRAW A,B
3090 PLOT 40,140: DRAW A,B
3095 BEEP 1/200,-5
3100 PLOT 40,35: DRAW -A,-B
3110 PLOT 215,35: DRAW -A,-B
3120 PLOT 215,140: DRAW -A,-B
3130 PLOT 40,140: DRAW -A,-B
3140 PLOT 40,35: DRAW -A,B
3150 PLOT 215,35: DRAW -A,B
3160 PLOT 215,140: DRAW -A,B
3170 PLOT 40,140: DRAW -A,B
3180 PLOT 40,35: DRAW A,-B
3181 PLOT 215,35: DRAW A,-B
3182 PLOT 215,140: DRAW A,-B
3183 PLOT 40,140: DRAW A,-B
3190 NEXT F
3195 BEEP 1/5,5: BEEP 1/5,5: BEE
P 1/5,5: BEEP 1/5,5
3196 BEEP 1/7,7: BEEP 1/7,10: BE
EP 1/5,5: BEEP 1/9,10: PAUSE 50
3200 LET Z=21: FOR F=0 TO 11: PR
INT AT F,0;"
            ": PRINT AT Z,0;"
                              ":
 LET Z=Z-1: BEEP 1/55,F: BEEP 1/5
5,Z: NEXT F
3210 RETURN
4000 REM spectrum
4010 BORDER 2: INK 6: PAPER 0: C
LS
4015 INK INT (RND*6+1)+1
4017 FOR f=1 TO 10: BEEP 1/100,f
*5: BEEP .003,50: BEEP .003,40:
BEEP .003,30: BEEP .003,20: BEEP
 .003,10
4018 NEXT f
4020 PRINT AT 2,5;"PULL THE PLUG
 THEN "
4030 PRINT FLASH 1;AT 4,11;"DUMM
Y!"
4040)PLOT 135,125: DRAW 32,-32:
PLOT 134,124: DRAW 32,-32: PLOT
133,123: DRAW 32,-32: PLOT 132,1
22: DRAW 32,-32: PLOT 131,121: D
RAW 32,-32: PLOT 162,86: DRAW 8,
8: DRAW 0,-8: DRAW -8,0
4050 PLOT 16,0: DRAW 0,65: DRAW
190,0: DRAW 0,-65: PLOT 16,25: D
RAW 190,0: PLOT 16,28: DRAW 190,
0
4060 PLOT 24,8: DRAW 12,0: DRAW
0,8: DRAW -12,0: DRAW 0,-8
4070 PLOT 42,8: DRAW 12,0: DRAW
0,8: DRAW -12,0: DRAW 0,-8
4080 PLOT 60,8. DRAW 12,0: DRAW
0,8: DRAW -12,0: DRAW 0,-8
4090 PLOT 78,8: DRAW 12,0: DRAW
0,8: DRAW -12,0: DRAW 0,-8
4100 PLOT 96,8: DRAW 12,0: DRAW
0,8: DRAW -12,0: DRAW 0,-8
4110 PLOT 114,8: DRAW 12,0: DRAW
 0,8: DRAW -12,0: DRAW 0,-8
4120 PLOT 132,8: DRAW 12,0: DRAW
 0,8: DRAW -12,0: DRAW 0,-8
4130 PLOT 150,8: DRAW 12,0: DRAW
 0,8: DRAW -12,0: DRAW 0,-8
4140 PLOT 168,8: DRAW 12,0: DRAW
 0,8: DRAW -12,0: DRAW 0,-8
4150 PLOT 186,8: DRAW 12,0: DRAW
 0,8: DRAW -12,0: DRAW 0,-8
4160 PLOT 31,60: DRAW -8,0: DRAW
 0,-3: DRAW 8,0: DRAW 0,-3: DRAW
 -8,0
4170 PLOT 36,60: DRAW 0,-6: PLOT
 36,62
4180 PLOT 40,54: DRAW 0,6: DRAW
8,0: DRAW 0,-6
4190 PLOT 60,54: DRAW -8,0: DRAW
 0,6: DRAW 8,0
4200 PLOT 64,62: DRAW 0,-8
4210 PLOT 69,60: DRAW 8,0: DRAW
0,-3: DRAW -8,0: DRAW 0,-3: DRAW
 8,0: DRAW 0,3
4220 PLOT 81,62: PLOT 81,60: DRA
W 0,-6
4230 PLOT 84,54: DRAW 0,6: DRAW
8,0
4240 PLOT 24,47: DRAW 4,0: DRAW
-4,-4: DRAW 4,0
4250 PLOT 30,47: DRAW 4,-4: PLOT
 34,47: DRAW -4,-4
4260 PLOT 43,47: DRAW -4,0: DRAW
 0,-2: DRAW 4,0: DRAW 0,-2: DRAW
 -4,0
4270 PLOT 45,47: DRAW 4,0: DRAW
0,-4: DRAW -4,0: DRAW 0,-2: DRAW
 0,6
4280 PLOT 51,47: DRAW 4,0: DRAW
0,-2: DRAW -4,0: DRAW 0,2: DRAW
0,-4: DRAW 4,0
4290 PLOT 61,47: DRAW -4,0: DRAW
 0,-4: DRAW 4,0
4300 PLOT 63,48. DRAW 0,-4: PLOT
 64,43. DRAW 2,9. PLOT 64,47. PL
OT 65,47
4310 PLOT 72,47: DRAW -4,0: DRAW
 0,-4
4320 PLOT 74,47: DRAW 0,-4: DRAW
 4,0: DRAW 0,4
4330 PLOT 80,43: DRAW 0,4: DRAW
3,0: DRAW 0,-4: DRAW 0,4: DRAW 3
,0: DRAW 0,-4
4340 PLOT 192,66: DRAW 0,6: PLOT
 186,66. DRAW 8,0. DRAW 2,10. PL
OT 192,72: DRAW -2,10: PLOT 186,
82: DRAW 0,20: PLOT 190,82: DRAW
 0,20
4440 GO TO 4015
5000 IF S=5 THEN LET Q$="♪": LET
 INK=6
5010 IF S=6 THEN LET Q$="✔": LET
 INK=4
6020 IF S=7 THEN LET Q$="♪": LET
 INK=2
6030 IF S=8 THEN LET Q$="♥": LET
 INK=3
5040 IF S=9 THEN LET Q$="●": LET
 INK=2
5050 IF S=10 THEN LET Q$="◆": LE
T INK=6
5060 RETURN
7000 FOR A=USR "a" TO USR "h"+7:
 READ B: POKE A,B: NEXT A: DATA
24,24,60,231,231,60,24,24,255,17
,255,68,255,17,255,68,23,23,3,10
,126,60,124,124,124,124,56,16,16
,124,112,248,248,112,104,4,2,1,1
0,17,34,103,242,240,96,255,195,1
89,165,165,189,195,255
7010 FOR C=USR "n" TO USR "u"+7:
 READ D: POKE C,D: NEXT C: DATA
0,2,6,6,14,28,120,0,0,24,60,255,
126,126,102,66,0,0,0,1,1,1,1,1,1
,6,30,124,252,248,120,112,96,48,
40,36,34,111,111,38,8,62,127,62,
62,28,28,8,0,60,126,118,126,126,
60,0,0,0,28,62,127,62,28,0: RETU
RN
```

```
   3*LOAD"data"1D00
   4FORI=&B00TO&BFF:?I=16:NEXT
   5*KEY0FORA%=0TO&FF:A%?&C00=A%?&2F00:
NEXT:FORA%=0TO &C53 STEP4:A%!&E00=A%!&30
00:NEXT:F.A%=0TO4400:A%?&1B00=A%?&1D00:N
.:PAGE=&1B00|MOLD|MVDU6|MRUN|M
   6VDU21
   7*FX138,0,128
   8END
```

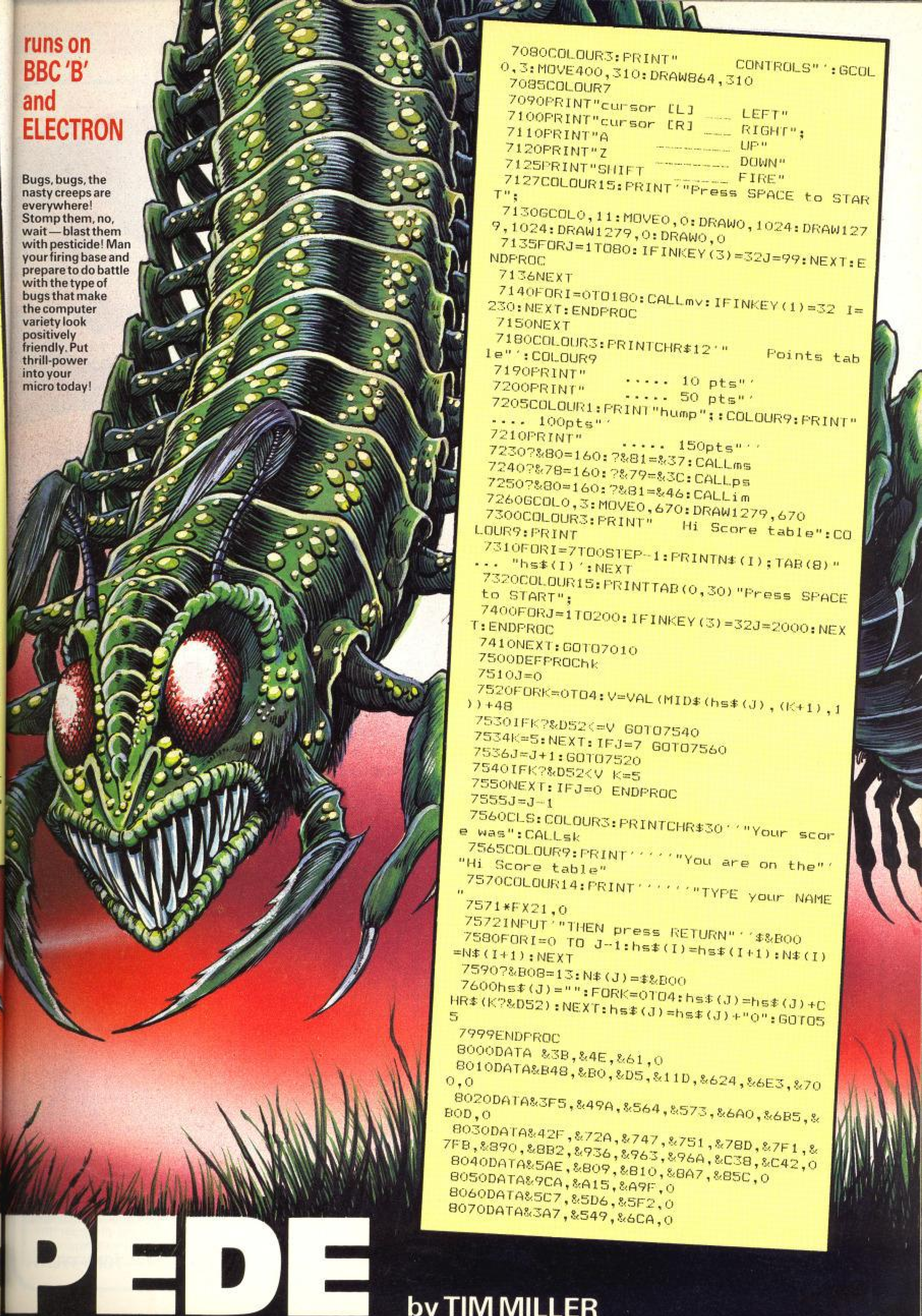
```
    2MODE2:DIMN$(7),hs$(7)
    5!&D52=&30303030:?&D56=48:!&D58=&303
03030:?&D5C=48
    6ENVELOPE 3,1,8,2,-4,10,5,10,30,-2,0
,-1,126,0
    7ENVELOPE 4,1,14,11,6,1,3,4,40,-1,0,
-1,126,0
   13ENVELOPE 1,1,-10,-20,-20,12,12,12,1
2,10,-1,-1,126,0
   14ENVELOPE 2,130,9,-5,-20,2,2,2,126,-
1,-10,-50,126,120
   20VDU23;8202;0;0;0;19,1,2,0;0,19,7,1,
0;0,19,14,3,0;0,19,11,0,0;0,19,3,6,0;0,1
9,4,15,0;0,19,2,1,0;0,19,10,2,0;0,19,12,
7,0;0,19,15,7,0;0,19,13,4,0;0,19,6,7,0;0
,19,13,4,0;0,19,9,5,0;0
   30FORI=0TO7:N$(I)="----------":hs$(I)="
000000":NEXT
   40*FX4,1
   42*FX11,0
   44*FX13,6
   50PROCmac:?&82=0
   55PROCtitle:CLS
   60GCOL0,11:MOVE16,64:DRAW16,960:DRAW1
263,960:DRAW1263,64
   65GCOL0,7:MOVE0,0:DRAW0,64:PLOT85,127
9,0:PLOT85,1279,64:FORI=0TO3:GCOL0,14:MO
VE0,I*16:DRAW1279,I*16:FORJ=0TO1400STEP6
4:MOVEJ-I*32,I*16:DRAWJ-I*32,I*16+16:NEX
T:NEXT
  120GCOL0,7:MOVE0,980:DRAW1279,980:COLO
UR15:PRINT" M i c r o p e d e "
  125CALLiv:COLOUR9:PRINTCHR$30''"SCORE"
;TAB(18);"HI"TAB(14,3);:CALLhs:PRINTCHR$
8;
  150CALL ba:CALLps:CALLdm:CALLsu:CALLbo
:CALLdl:CALLpg:FORI=90TO50STEP-10:SOUND1
,4,I,5:NEXT:CALLpg1
  160FORJ=1TO3000:NEXT:PROChk:GOTO55
 1000DEFPROCmac:ob=&FFF4:z=&E00
 1020FOR I=0TO2 STEP 2
 1030bo=z+&D9:di=z+&14B:bc=z+&219:mo=z+&
2ED:co=z+&317:fi=z+&36F:ba=z+&92
 1040sk=z+&4A1:hs=z+&4BF:ad=z+&4D2:rnd=z
+&4E6:st=z+&4F7:up=z+&50F:up3=z+&525:ce=
z+&531
 1050sn=z+&5B7:ps=z+&5F6:sc0=z+&637:ms=z
+&65D:wa=z+&685:mv=z+&69C:im=z+&6D4:mi=z
+&704
 1100RESTORE8000:FORJ=1TO8:READa:REPEAT:
P%=z+a:IFJ=1[OPTI:JSRst:]
 1110IFJ=2[OPTI:JSRz:]
 1120IFJ=3[OPTI:JSRbo:]
 1130IFJ=4[OPTI:JSRrnd:]
 1140IFJ=5[OPTI:JSRad:]
 1150IFJ=6[OPTI:JSRba:]
 1160IFJ=7[OPTI:JSRps:]
 1170IFJ=8[OPTI:JSRup3:]
 1180READa:UNTILa=0:NEXT
 1200P%=z+&3C8:[OPTI:JSRup:]
 1210P%=z+&3D5:[OPTI:JSRsc0:]
 1220P%=z+&3E7:[OPTI:JMPce:]
 1230P%=z+&3EE:[OPTI:JMPce:]
 1280P%=z+&49D:[OPTI:JSRoi:]
```

```
 1330P%=z+&579:[OPTI:JSRaq:]
 1420P%=z+&6A3:[OPTI:JSRco:]
 1425P%=z+&6AA:[OPTI:JSRmo:]
 1440P%=z+&6CD:[OPTI:JSRsc0:]
 1445P%=z+&6D0:[OPTI:JSRce:]
 1470P%=z+&71B:[OPTI:JSRim:]:P%=z+&727:[
OPTI:JSRim:]
 1490P%=z+&78A:[OPTI:JSRim:]
 1500oj=z+&79F:dt=z+&8F6:dm=z+&927
 1600P%=z+&987:[OPTI:JSRms:]
 1605dl=z+&9A6:lg=z+&9E7
 1620P%=z+&A7C:[OPTI:JSRdl:]:P%=z+&A8C:[
OPTI:JSRdl:]
 1630si=z+&AA6:P%=z+&AAB:[OPTI:JSRmi:]
 1640FORJ=&668TO&681STEP25:P%=z+J:[OPTI:
JSRay:]:NEXT
 1650su=z+&AC6:cs=z+&AF0:P%=z+&AF8:[OPTI
:JSRww:]:P%=z+&B25:[OPTI:JSRdm:]:ay=z+&B
3F:iv=z+&B4C:cd=z+&BE7:ww=z+&BFB
 1655P%=z+&C02:[OPTI:JSRsu:]
 1660pg1=z+&C30:P%=&1A54:[OPTI
 1900.baf LDA£0:STA&70:LDA£19:JSRob:JSRb
a:JSRbc:JSRdi:LDA£1:STA&70:LDA£0:STA&D30
+16:JSRba:JSRlg:RTS
 2000.ag RTS
 3000.pg JSRsn:JSRdt:JSRbaf:JSRfi:JSRcs:
JSRsk:JSRmv:JSRfi:JSRsn:JSRdt:JSRfi:JSRc
s:JSRwa:JSRsi
 3010JSRcd:LDA&D6B:BEQpg
 3020RTS
 6999]:NEXT:ENDPROC
 7000DEFPROCtitle
 7002*FX21,0
 7003CALLiv
 7005GOTO7180
 7010CLS:COLOUR14:COLOUR130:PRINT'" M I
 C R O P E D E ":COLOUR128:CALLiv:CALLsu:
?&70=0:CALLbo
 7020COLOUR9:PRINT'"author - Tim Miller"
 7030COLOUR3:VDU5:MOVE176,814:PRINT"copy
right  (C)":MOVE176,776:PRINT"T.M.MILLER
 1984":VDU 4:PRINT''
 7035GCOL0,3:MOVE164,732:DRAW164,828:DRA
W1132,828:DRAW1132,732:DRAW164,732
 7040COLOUR7:PRINT'''"    A leakage of"
 7045PRINT"   radiation has"'"    caused
 strange"
 7050COLOUR15:PRINT"       mutations":COL
OUR7:PRINT"  in your garden !"
 7060COLOUR1:PRINT'"   You must guard"'
  your garden wall"
 7070PRINT" by firing pesticide"
```



MICR

```
727:[
A8C:[
i:]
OPTI:
[OPTI
v=z+&B
b:JSRb
TA&D30
JSRcs:
i:JSRc
'" M I
CALLsu:
Miller"
NT"copy
.MILLER
828:DRA
2
ge of"
caused
ons":COL
guard"'"
```



runs on BBC 'B' and ELECTRON

Bugs, bugs, the nasty creeps are everywhere! Stomp them, no, wait — blast them with pesticide! Man your firing base and prepare to do battle with the type of bugs that make the computer variety look positively friendly. Put thrill-power into your micro today!

```
7080COLOUR3:PRINT"          CONTROLS"':GCOL
0,3:MOVE400,310:DRAW864,310
7085COLOUR7
7090PRINT"cursor [L] ___ LEFT"
7100PRINT"cursor [R] ___ RIGHT";
7110PRINT"A          _______ UP"
7120PRINT"Z          _______ DOWN"
7125PRINT"SHIFT      _______ FIRE"
7127COLOUR15:PRINT'"Press SPACE to STAR
T";
7130GCOL0,11:MOVE0,0:DRAW0,1024:DRAW127
9,1024:DRAW1279,0:DRAW0,0
7135FORJ=1TO80:IFINKEY(3)=32J=99:NEXT:E
NDPROC
7136NEXT
7140FORI=0TO180:CALLmv:IFINKEY(1)=32 I=
230:NEXT:ENDPROC
7150NEXT
7180COLOUR3:PRINTCHR$12'"      Points tab
le"':COLOUR9
7190PRINT"         ..... 10 pts"'
7200PRINT"         ..... 50 pts"'
7205COLOUR1:PRINT"hump";:COLOUR9:PRINT"
.... 100pts"'
7210PRINT"         ..... 150pts"''
7230?&80=160:?&81=&37:CALLms
7240?&78=160:?&79=&3C:CALLps
7250?&80=160:?&81=&46:CALLim
7260GCOL0,3:MOVE0,670:DRAW1279,670
7300COLOUR3:PRINT"   Hi Score table":CO
LOUR9:PRINT
7310FORI=7TO0STEP-1:PRINTN$(I);TAB(8)"
... "hs$(I)':NEXT
7320COLOUR15:PRINTTAB(0,30)"Press SPACE
to START";
7400FORJ=1TO200:IFINKEY(3)=32J=2000:NEX
T:ENDPROC
7410NEXT:GOTO7010
7500DEFPROChk
7510J=0
7520FORK=0TO4:V=VAL(MID$(hs$(J),(K+1),1
))+48
7530IFK?&D52<=V GOTO7540
7534K=5:NEXT:IFJ=7 GOTO7560
7536J=J+1:GOTO7520
7540IFK?&D52<V K=5
7550NEXT:IFJ=0 ENDPROC
7555J=J-1
7560CLS:COLOUR3:PRINTCHR$30''"Your scor
e was":CALLsk
7565COLOUR9:PRINT''''"You are on the"'
"Hi Score table"
7570COLOUR14:PRINT''''''"TYPE your NAME
"
7571*FX21,0
7572INPUT'"THEN press RETURN"''$&B00
7580FORI=0 TO J-1:hs$(I)=hs$(I+1):N$(I)
=N$(I+1):NEXT
7590?&B0B=13:N$(J)=$&B00
7600hs$(J)="":FORK=0TO4:hs$(J)=hs$(J)+C
HR$(K?&D52):NEXT:hs$(J)=hs$(J)+"0":GOTO5
5
7999ENDPROC
8000DATA &3B,&4E,&61,0
8010DATA&B48,&B0,&D5,&11D,&624,&6E3,&70
0,0
8020DATA&3F5,&49A,&564,&573,&6A0,&6B5,&
B0D,0
8030DATA&42F,&72A,&747,&751,&78D,&7F1,&
7FB,&890,&8B2,&936,&963,&96A,&C38,&C42,0
8040DATA&5AE,&809,&810,&8A7,&85C,0
8050DATA&9CA,&A15,&A9F,0
8060DATA&5C7,&5D6,&5F2,0
8070DATA&3A7,&549,&6CA,0
```

PEDE

by TIM MILLER

ADVANCED DUNGEONS AND DRAGONS

No2 MATTEL





THE VERY first contact of any sort I had with "computer" was some time ago now, when a friend lent me an Intellivision system with a few random cartridges.

It was late; and outside the windows of my small rustic dwelling the wind howled fitfully. Onscreen a small determined figure stalked manfully through a labyrinth of endless branching corridors, bow in hand. All was silence save for my own increased breathing and the occasional faraway rumble of a sleeping Dragon — and, of course, the wind.

A bat appeared, flapping repulsively around my head. Maddened, I shot it. Two arrows left. Another bat appeared. I fled, precipitately — straight into the lair of a giant rat, which made for me, squeaking wickedly. Fumbling in fear, I shot that too — but not before my little man had turned red with his own gore, having taken a severe wound from the oversized and malign rodent.

The Giant Snake got me just around the next corner. Hissing like a Fury, it came at me with terrifying speed. One arrow — my last — had no effect. I fled. Too late. In my terror, I messed up my exit . . . and the serpent was on me.

A ferocious grunting . . . a convulsive struggle . . . and what was left of my (vicarious) mortal soul went up in a coil of steam.

Shuddering with tension, I set out with a new expedition member. Surely he could make the Cloudy Mountain, claim the two lost halves of the Crown of Kings, and declare himself The Winner?

He didn't. Nor did his one remaining pal.

I eventually got to bed at 4 a.m., having totally failed to crack *Advanced Dungeons and Dragons* on any level, even the easiest.

If this was the standard of video games, I told myself, I was going to enjoy this new diversion. Alas, it wasn't (though I came to enjoy the diversion anyway). In fact, as I soon realised — and was later to have confirmed by personal experience (as well as others' opinions) — this particular game cartridge, crafted by some anonymous Mattel keyboard slave for the Intellivision machine, was, and remains, in a class of its own.

For the uninitiated, the game places a three-man expedition at the far side of a Middle-earth-like map — different every time — made up of mountains (both passable and impassable), forests, rivers and fortress walls. The mission of the team is quite simply to cross the landscape from left to right, reach the fabled Cloudy Mountain, enter it, and find the halves of the Lost Crown.

To do this you steer your team towards suitable mountains, taking the obstacles as they come and choosing your own route. If a mountain is enterable (i.e. crossable) it will change colour; if not, it won't, and you have to find some other way.

Once inside the mountain the screen changes with a nerve-stiffening 'whoosh'. You are inside the tunnel system, armed with three (count 'em) arrows and your wits. The adventurer stays screen centre, while the labyrinth scrolls omnidirectionally. As he advances, the tunnels light up and stay lit (so you can tell where you've been before). Your object is to find one of the tools (axe, boat, key) which you will need to complete the journey; you can find more arrows in a quiver. You will also need to find the way out (a ladder).

Preventing you from carrying out these reasonable tasks are bats, spiders, giant rats, giant snakes, blobs, demons and dragons. They are all extremely nasty.

Bats flap and make you panic but can otherwise cause you little harm. Shoot these only when you have a generous surplus of arrows. Spiders crawl slowly and are easily avoided, though if they touch you they will claim an arrow for each contact. Blobs move very slowly indeed, and can — must — be avoided, since one touch is instant death and they cannot be shot. Rats can be offed with one arrow — but snakes, demons and dragons take two (winged dragons, which appear only in the last mountain, take three). They also move extremely fast and will chase you. Ever tried shooting while running? Can't be done. You must flee, find suitable terrain (long straight corridors are ideal), plant your feet, aim carefully, and let the beastie have it as it charges. Keep your nerve and don't be ashamed to run for it.

Additional touches emerge as you get into the game. Monsters will wake and make some noise or other if they are onscreen (whether visible or not), thus allowing you to deduce where they must be lurking. Monsters will pursue you for a surprisingly long way, necessitating absolute sureness of touch with the disc, since these corridors twist and turn a lot; a hangup when some foul creature is closing fast, bellowing, is certain death. And, on the more difficult levels of play (there are four), even when you run for it the Things run faster than you. On 'Hero' level Dragons and Demons and Snakes, in particular, attack with such devastating speed that it become absolutely essential to have a good suss on where they are before advacing. Then shoot into the dark.

But when you finally do cross all the mountain barriers and reunite the two halves of the Crown . . . then there's an immense feeling of satisfaction, considerably enhanced by a vast, reverberating chime of solemn celebration which almost outdoes the famous long-distance chord at the end of the Beatles' *A Day In The Life*.

Advanced Dungeons and Dragons is an eerie, astonishing game, a piece of programming wizardry and an absolutely superb example of overall game design (not at all the same thing). In the heydey of Intellivision's fortunes in the US (say, a year ago) it was rarely out of the ROM charts; over here, its virtues are known only to Intellivison owners (I remain one of these, for the sake of this game alone).

Unfortunately this situation is not now likely to change. More's the pity. The system has been overtaken by events and by technology — and fashion — but it remains a very good video game system indeed; not so much on account of the hardware (which, the disc apart, is excellent), but for the remarkably high standard of the software. And of the latter, few I think will argue if I claim premier all-time place for the Jewel in Mattel's Crown.

TONY TYLER

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DUCKWORTH

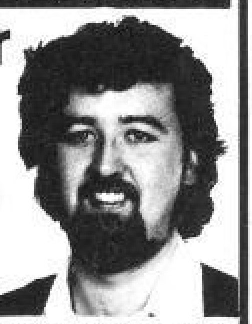
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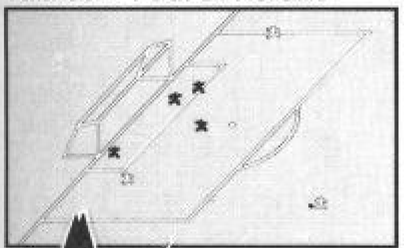
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Addictive

* ZX81 Chart
Home Computing Weekly 1.8.83 and 1.11.83.

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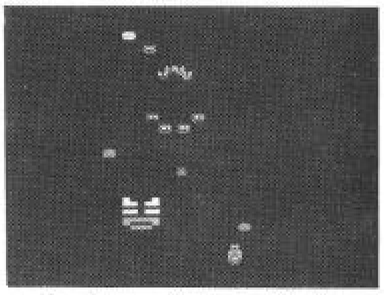
This powerful and versatile utility package is far and away the leader in the field of graphical animation, bringing FASTEST EVER screen movement to your own character designs, together with a host of special features and effects. SPRITES are user-defined shapes that can be controlled from any Basic program. They are moved quickly and simply by calls to a machine code routine which is located together with the sprite images in front of your Basic program. The speed and simplicity of sprites is a boon to games programmers and to those who need to illustrate and animate their work.

The package includes two GENERATOR PROGRAMS which you use to create your own sprite designs. All 16 logical colours are available in each design, and as you create the image it is stored within the sprite routine. Sprite sizes range from a single pixel to the 24 x 24 pixel SUPERSPRITE! Once you have designed the sprites you need, the generator program may be erased from the memory. No longer do you have to spend half your program actually designing the shapes you need to use!

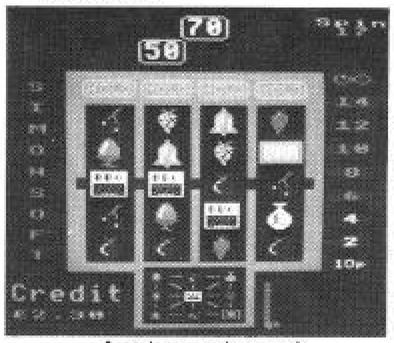
Once you have designed your own sprites, or used one of the 'books' in the LIBRARY OF SPRITE DESIGNS provided, you are ready to animate your program. 'To move a sprite, all that needs to be done is to increment or decrement its position coordinates and call the routine! The machine code takes care of the rest. Each sprite has TWO separate images and if these images are designed differently, instant animation effects are achieved as soon as you move the sprite! Frogs will hop and horses trot as each image is displayed alternatively in the pixel-by-pixel movement across the screen. To give you an idea of the speed of sprites, a single sprite moving one pixel at a time can cross the whole screen in 0.35 of a second!

The package is distinguished by the amazing and revolutionary features that are offered. Up to 48 SPRITES may be on screen at any one time (12 separately designed base sprites each with 3 independently moving clones). The incredible enlargement facility allows up to FIVE TIMES MAGNIFICATION of sprites, so that the sprites can suddenly loom out of the screen in a 3D effect or even remain enlarged throughout the program, moving as normal. A COLLISION DETECTOR will report back to Basic with the numbers of user-defined directions, and sprites may be allocated to any of the paths. Wherever the sprite is called, it will automatically move by the amount specified by the path.

Twenty different routines allow any combination of the above features, together with EOR transfer (direct) plotting and transfer plotting with background storage/replacement. Economise on memory space by choosing the routine with just the features you need in your program. Two demonstration games, an introductory program and an excellent 32 page colour manual are included in the package. The programs are compatible with disc/cassette-based systems, and can be bought already on 40/80 track discs (please specify) for an extra £3. Our only plea is DON'T OPT FOR ANYTHING LESS — it is probably more expensive and certainly won't contain anything the features of SIMONSOFT SPRITES VERSION TWO.



Actual screen photograph of 'Devil Swarm', a demo tape



Actual screen photograph

SUPERFRUIT (32K) £5.95

Simply the best. Full colour high resolution graphics. Spinning reels with 'bounce'. Incredible gamble effects, hold, 3 types of gamble, swap reels, two-way nudge, nudge gambles, coin pile that shrinks/grows, great sound effects. Separate instruction program. This implementation is in a class of its own.

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NEW

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The Three Island Adventure

A beautifully designed adventure with a wealth of puzzles of logic, imagination and wit that build up into an intriguing pattern. Tackle beanstalks, irate gardeners and prigish chemistry teachers! Brilliant use has been made of sound and Mode 7 graphics with full-screen pictures, set in varied terrain, from sand dunes to mansions, the adventure provides an exciting range of locations through which the castaway must pass in search of priceless treasures and cryptic clues. The entrancing full colour pictures will take you deep into the world of the Three Islands in a way that the text-only adventure never could.



Actual screen photograph

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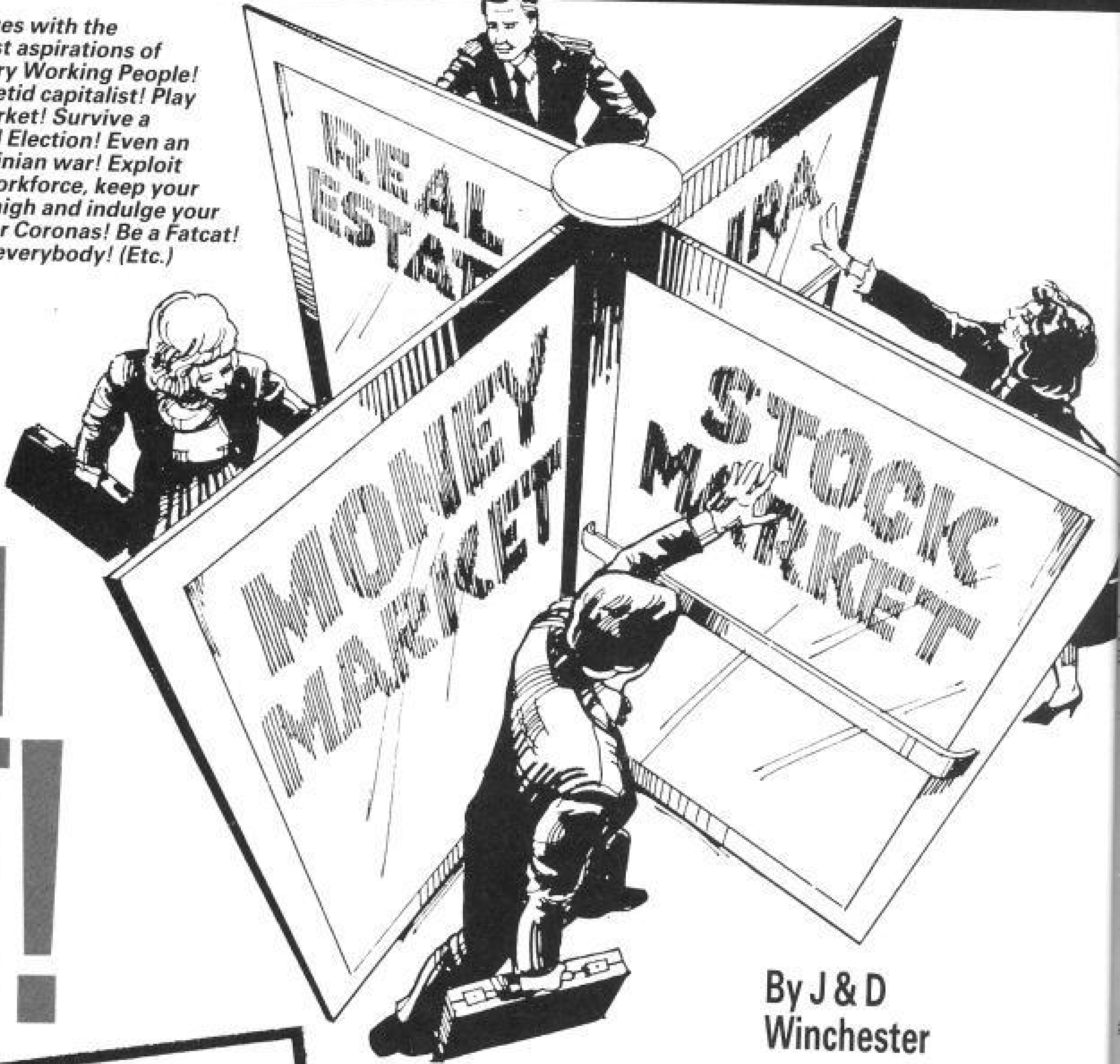
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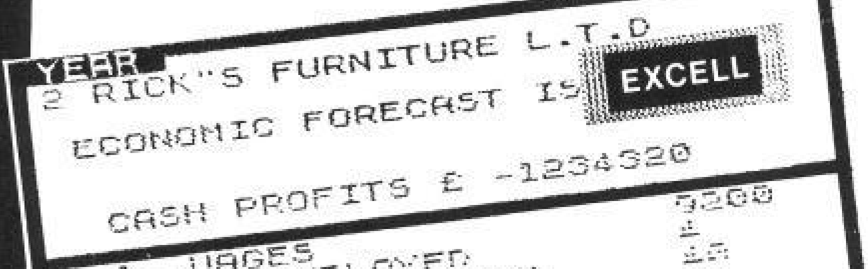
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By J & D Winchester






```
   2 GOTO 6
   3 PRINT AT 18,1;"
   5 RETURN
   6 LET S=0
   7 LET TAX=5000
   9 LET X$="CONSERVATIVE"
  10 GOSUB 3000
  11 PRINT AT 3,3;"[illegible]";AT
 4,3;"[illegible]";AT 5,3;"[illegible]
  12 PRINT AT 18,1;"[illegible]
[illegible]";AT 19,1;"[illegible]
[illegible]";AT 20,1;"[illegible]
  20 PRINT AT 10,3;"ENTER YOUR N
AME"
  25 LET H$="080000000000000000000
0000000000000000000000000000000000
0000000000000"
  30 INPUT N$
  50 LET C$="[illegible]
[illegible]"
  55 LET D1=100
  59 LET B1=6000
  61 LET B=6000
  62 LET C=0
  63 LET D=100
  64 LET F=50
  65 LET CAR=0
  66 LET RND=0
  67 LET AD=2.5
  70 DIM G$(40)
  75 LET M=INT (RND*6)
  76 GOSUB 3000
  77 LET S=S+1
  78 LET D1=D
  79 LET B=INT B
  80 PRINT AT 1,3;N$;"""S FURNIT
URE L.T.D"
  81 LET B1=B
  82 PRINT AT 0,0;"[illegible]";AT 1,
1;S
  83 PRINT AT 2,22;"[illegible]";AT
 4,22;"[illegible]"
```

for SINCLAIR ZX81



```
  85 PRINT AT 3,2;"ECONOMIC FORECAST IS▒";C$(M*6+1 TO M*6+6);"▒"
  90 PRINT AT 6,3;"CASH PROFITS £ ";C
 100 PRINT AT 7,0;"▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀"
 110 PRINT AT 8,3;"1..WAGES",TAB 25,B;"  "
 120▒PRINT AT 9,3;"2..NO EMPLOYED";TAB 25;D;"  "
 125 PRINT AT 10,3;"3..COST (RAW MAT)";TAB 25;F;"  "
 130 PRINT AT 11,3;"4..  R.N.D";TAB 25;RND;
 135 PRINT AT 12,3;"ADVERTISING PER ITEM";TAB 25;AD;"  "
 140 IF CAR>0 THEN PRINT AT 13,3;"NO OF LORRYS";TAB 25;CAR
 150 PRINT AT 14,3;"▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒";AT 15,3;"▒▒PRESS 6 TO START▒▒";AT 16,3;"▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒"
 160 PRINT AT 17,0;"▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀"
 170 INPUT A
 180 IF A<0 OR A>6 OR INT (A/1)<>A/1 THEN GOTO 170
 190 IF A=6 THEN GOTO 400
 200 GOSUB A*20+200
 205 PRINT AT A+7,25;"      "
 206 GOTO 110
 220 PRINT AT 18,3;"WAGES (£3,500-11,000)"
 225 LET B1=B
 226 INPUT B
 227 IF B<3500 OR B>11000 THEN GOTO 225
 230 GOSUB 3
 235 RETURN
 240 PRINT AT 18,3;"NO. EMPLOYED (0-150)"
 241 LET D1=D
 242 INPUT D
 250 IF D<0 OR D>150 THEN GOTO 242
 255 GOSUB 3
 256 RETURN
 260 PRINT AT 18,3;"RAW MAT COST PER ITEM(30-70)"
 263 INPUT F
 264 IF F<30 OR F>70 THEN GOTO 263
 265 GOSUB 3
 270 RETURN
 280 PRINT AT 18,3;"R.N.D   (NO LIMIT)"
 285 INPUT RND
 290 GOSUB 3
 295 RETURN
 300 PRINT AT 18,3;"AD PER ITEM (1-15)"
 305 INPUT AD
 306 IF AD<1 OR AD>15 THEN GOTO 300
 307 GOSUB 3
 308 RETURN
 310 RETURN
 400 LET Q=INT (RND*20)
 401 LET QW=0
 405 IF Q<17 THEN GOTO 410
 406 LET QW=RND*INT (RND*30*2)
 410 LET MI=500
 415▒IF C/100000<=CAR+1 THEN GOTO 431
 420 GOSUB 3000
 425 PRINT AT 10,1;"DO YOU WANT TO SPEND 30000 ON"
 426 PRINT AT 11,1;"A LORRY(Y/N)"
 427 INPUT K$
 428 IF K$(1)="N" THEN GOTO 431
 429 LET CAR=CAR+1
 430 LET C=C-30000
 433 GOSUB 3000
 434 PRINT AT 1,3;"THE YEAR PASSES","▀",,
 435 IF D<D1 THEN GOSUB 450
 436 IF B<B1 THEN GOSUB 460
 437 IF F<60-INT (RND*15+5) THEN GOSUB 470
 438 IF INT (RND*(15-CAR))<4 THEN GOSUB 480
 440 GOTO 490
 450 PRINT TAB 1;"YOU LAYED OFF ";D1-D;" WORKERS"
 451 PRINT TAB 1;"AND PAYED ";(D1-D)*10000;" REDUNDANCY"
 452 LET MI=MI+((D1-D)*10000)
 454 RETURN
 460 PRINT TAB 1;"YOU CUT WAGES BY ";B1-B;" AND"
 461 PRINT TAB 1;"LOST ";50*B1-B;" IN STRIKE DAYS"
 462 LET MI=MI+50*B1-B
 465 RETURN
 470 PRINT TAB 1;"YOUR LOW COST OF ";F;" POUNDS"
 472 PRINT TAB 1;"MEANT BAD QUALITY GOODS AND "
 473 PRINT TAB 1;"YOU WERE FORCED TO SPEND AN "
 474 PRINT TAB 1;"EXTRA ";(60-F)*1041;" ON ADVERTISING"
 475 LET MI=MI+((60-F)*1041)
 476 RETURN
 480 PRINT TAB 1;"YOU SPENT ";CAR*1250;" ON LORRY",TAB 3;"REPAIRS"
 481 LET MI=MI+CAR*1250
 483 RETURN
 495 PRINT AT 20,1;"TOTAL MISC £ ";MI
 500 INPUT I$
 501 GOTO 8000
 502 GOSUB 3000
 510 PRINT AT 1,3;N$;"""S RESULTS"
 520 PRINT AT 2,0;"▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀"
 535 PRINT AT 3,3;"TAXES",TAX
 530 PRINT AT 4,3;"WAGES",D*B
 540 PRINT AT 5,3;"RAW MAT",D*100*F
 550 PRINT AT 6,3;"TRANSPORT",(10-CAR)*3000
 555 PRINT AT 7,3;"MISC",MI
 560 PRINT AT 8,3;"R.N.D",RND
 570 PRINT AT 9,15;"▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀"
 575 LET TOT=D*B+D*100*F+TAX+((10-CAR)*3000)+MI+RND
 580 PRINT AT 10,3;"TOTAL",TOT
 590 PRINT AT 11,0;"▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀"
 595▒LET IT=(M/2+1.5)*((D*100)-(100*(17-AD)))
 600 PRINT AT 12,3;"ITEMS SOLD",D*100-(15-AD)
 605 PRINT AT 13,3;"R.N.D PROFIT",QW
 610 PRINT AT 14,3;"GROSS PROFIT",IT*F+QW
 611 PRINT AT 15,0;"▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀"
 615 PRINT AT 16,3;"NET PROFIT",(IT*F+QW)-TOT
 617 LET C=C+((IT*F+QW)-TOT)
 620 INPUT I$
 625 GOSUB 3000
```

```
 626 PRINT AT 1,1;N$;"""S NET PR
OFITS"
 627 PRINT AT 20,1;" ...........
....................."
 630 LET O=((IT*F+QW)-TOT)/75000
 631 IF O>=0 THEN LET O=O+8
 635 IF O<8 THEN LET O=8
 638 IF O>38 THEN LET O=38
 639 LET O=INT O
 640 LET H$(S*2+1 TO S*2+2)=STR$
O
 650 FOR L=3 TO S*2+1 STEP 2
 660 LET AA=L+2
 670 LET CC=L+1
 680 LET BB=VAL H$(L TO L+1)
 690 LET DD=VAL H$(L-2 TO L-1)
 700 LET X=CC-AA
 710 LET Y=DD-BB
 720 LET MM=ABS X
 730 IF ABS Y>M THEN LET M=ABS Y
 740 FOR N=M-1 TO 0 STEP -1
 750 PLOT AA+N*X/M,BB+N*Y/M
 760 NEXT N
 770 NEXT L
 780 INPUT I$
 785 IF S=20 THEN GOTO 4000
 790 GOTO 75
2999 STOP
3010 PRINT AT 0,0;"████████████
████████████";AT 21,0;"█████████
████████████████████████"
3020 FOR L=1 TO 20
3030 PRINT AT L,0;"█
                              █"
3040 NEXT L
3050 RETURN
4000 GOSUB 3000
4010 PRINT AT 3,3;N$;"""S FINAL
RESULTS"
4020 PRINT AT 5,3;"CASH PROFITS"
;C
4021 LET P$="LABOURER"
4023 IF C>100000 THEN LET P$="PL
ANT MANAGER"
4030 IF C<10000 THEN PRINT AT 10
,3;"MMMMMMMM"
4034 IF C>1000000 THEN LET P$="D
IRECTOR"
4036 IF C>10000000 THEN LET P$="
PRESIDENT"
4038 IF C>100000000 THEN LET P$=
"TYCOON"
4040 PRINT AT 10,3;N$;" YOURE NO
W A",TAB 3;P$
4041 STOP
8000 GOSUB 3000
8010 FOR P=1 TO 10
8020 PRINT AT 10,3;"SPECIAL ANNO
UNCEMENTS"
8030 PRINT AT 10,3;"SPECIAL ANNO
UNCEMENTS"
8040 NEXT P
8050 IF B>=B1 OR RND<.1 THEN GOT
O 9000
8055 IF RND>500000 AND RND>.2 TH
EN GOTO 9250
8056 IF S/5=INT (S/5) THEN GOTO
8100
8099 GOTO 502
8100 GOSUB 3000
8102 PRINT AT 3,3;"THE GENERAL E
LECTIONS ARE ",TAB 3;"TOMMOROW,A
S YOUR COMPANY ",TAB 3;"EMPLOYS
A MAJORITY OF THE ",TAB 3;"TOWNS
 POPULATION YOU CAN IN",TAB 3;"E
FFECT DECIDE THE OUTCOME"
8104 PRINT TAB 3;"CURRENT FIGURE
S"
8105█PRINT TAB 5;"UNEMPLOYMENT "
;INT (RND*2000000)+2000000
8107 PRINT TAB 5;"INFLATION ";IN
T (RND*10)+5
8109 PRINT TAB 3;"CURRENT GOV.
";X$
8110 PRINT TAB 3;"VOTE 1=ECO,2=L
AB,3=LIB+SDP",TAB 8;"4=CON"
8115 INPUT Z$
8117 IF Z$="2" THEN LET X$="LABO
UR"
8119 IF Z$="4" THEN LET X$="CONS
ERVATIVE"
8121 IF Z$="3" THEN LET X$="LIBE
RAL(SDP)"
8141 IF Z$="1" THEN LET X$="ECOL
OGY"
8142 IF Z$<>"1" AND Z$<>"2" AND
Z$<>"3" AND Z$<>"4" THEN GOTO 81
15
8145 LET R9=RND*VAL Z$
8150 IF R9<1 THEN LET TAX=100000
8153 IF R9<3.8 THEN GOTO 8057
8155 GOSUB 3000
8160 PRINT AT 3,1;"UNION POWER H
AS BEEN TOTALLY",TAB 1;"CUT.",TA
B 3;"THERE HAS BEEN A REVOLUTION
",TAB 1;"AND YOU WERE THE FIRST
",TAB 1;"AGAINST THE WALL"
8999 STOP
9000 GOSUB 3000
9001 IF B=7000 THEN GOTO 8051
9010 PRINT AT 1,1;"YOUR UNION IS
 NOW VOTING",TAB 1;"OVER INDUSTR
IAL ACTION AFTER",TAB 1;"YOUR PA
Y TALKS FAILED"
9015 FOR P=0 TO 10
9020 NEXT P
9025 LET INC=INT ((11000-B)/200)
9030 PRINT "█",,TAB 1;"THE VOTE
WENT BADLY",TAB 1;"(THEY""RE ON
STRIKE)",TAB 1;"ARE YOU WILLING
TO GIVE A ";INC,TAB 1;" O/O PAY
RISE";AT 18,14;"(Y/N)"
9040 INPUT A$
9041 IF A$="Y" THEN LET C=C-((C/
100)*INC)
9042 LET B=B+(B*(INC/100))
9043 IF A$="Y" THEN GOTO 8051
9050 IF A$="N" THEN GOTO 9060
9051 PRINT AT 20,1;"PLEASE ENTER
 Y OR N"
9052 GOTO 9040
9060 LET ARK=RND
9080 GOTO (9130 AND ARK<.33)+(92
00 AND ARK>.66)+(9081 AND ARK>=.
33 AND ARK<=.66)
9100 GOSUB 3000
9101 LET A=RND
9102 LET A$="BARDSY"
9103 IF A<.33 THEN LET A$="SKOME
R"
9104 IF A>.66 THEN LET A$="CHRIS
TMAS"
9105 PRINT AT 3,1;"THE ARGENTINE
S HAVE JUST ",TAB 1;"INVADED ";A
$;" ISLAND",TAB 1;"CLAIMING SOVE
RIENGTY"
9110 PRINT AT 8,1;"NATIONAL ATTE
NTION HAS BEEN",TAB 1;"DIVERTED
AND YOUR UNION BOSS",TAB 1;"HAS
JUST FLED TO CUBA"
9111 PRINT AT 20,1;"(PRESS ANY K
EY TO CONTINUE)"
9112 IF INKEY$="" THEN GOTO 9112
9120 GOTO 8051
9130 GOSUB 3000
9140 PRINT AT 3,1;"OH DEAR PICKE
TS ATTACKED YOUR",TAB 1;"FACTORY
.AND BURNT IT DOWN",TAB 1;"THE I
NSURANCE COMPANY CLAIM ",TAB 1;"
IT WAS AN ACT OF GOD"
9145 LET A=INT (RND*10000000)
9150 PRINT TAB 1;"YOU HAVE TAKEN
 THEM TO COURT",TAB 1;"YOU WON T
HE CASE AND GOT",TAB 1;"£ 75000
BUT DUE TO AN ERROR ",TAB 1;"YOU
 PAYED ";A;" ON THE CASE"
9160 INPUT U$
9180 PRINT AT 15,1;"YOU DO NOT H
AVE THE CASH",TAB 1;"PROFITS TO
PAY THE FEES ",TAB 1;"YOU ARE BU
ST AFTER ";S;" YEARS"
9181 STOP
9200 GOSUB 3000
9210 PRINT AT 8,1;"THE UNION AGR
EED TO MORE",TAB 1;"TALKS AND AN
 AGREEMENT OF",TAB 1;" 6.2 O/O",
TAB 1;"WAS REACHED"
9211 LET C=C*1.062
9230 INPUT A$
9240 GOTO 8051
9250 GOSUB 3000
9270 PRINT TAB 1;"AS YOU ONLY HA
VE £";C,TAB 1;"YOU ARE BUST AS Y
OUR BANK",TAB 1;"MANAGER REFUSES
 TO LEND TO ",TAB 1;"A ""BUNCH O
F MURDERERS""",TAB 1;"YOU ARE BU
ST AFTER ";S;" YEARS"
9275 STOP
```


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```
5 REM *********MAIN BODY PROGRAM****
10 GOSUB 8000
15 DIM T$(25):DIM F$(25):DIM Y$(1)
17 DIM LONG(2):DIM LAT(2):DIM COURSE$
(4):MOVE=0:SEARCH=0:TONE=150
20 GOSUB 9000
100 EST=INT(RND(0)*50)+150:RANGE=INT(R
ND(0)*50)+150
105 GOSUB 1000
106 GOSUB 1055:GOSUB 5050:GOSUB 1095
110 GOSUB  5000
120 IF EST>RANGE THEN GOSUB 5300:GOSUB
 5210:FRITZ=FRITZ+1:GOSUB 5340:GOSUB 536
0:GOTO 106
130 IF EST<RANGE THEN GOSUB 5090:GOSUB
 5500:GOSUB 5210:GOSUB 5360:GOTO 106
140 GOSUB 5090:GOSUB 5300:GOSUB 11000:
GOSUB 5340:GOSUB 5500:GOSUB 5210:GOSUB 5
360
160 GOTO 106
450 END
999 REM ***SCREEN 2 COMBAT************
1000 GRAPHICS 7:POKE 752,1:SOUND 3,250,
2,1
1005 SHIP=80:HORIZ=50:FRITZ=0
1010 POKE 708,12:POKE 709,2:POKE 710,0
1020 COLOR 1:PLOT 159,50:DRAWTO 0,51:DR
AWTO 0,0:POSITION 0,50:POKE 765,1:XIO 18
,#6,0,0,"S:"
1030 COLOR 3:PLOT SHIP,HORIZ
1040 PLOT 159,95:DRAWTO 159,51:DRAWTO 0
,51:POSITION 0,95:POKE 765,3:XIO 18,#6,0
,0."S:"
1050 ? "K";"   ENEMY IN SIGHT!":FOR DE=
1 TO 250:NEXT:DE:RETURN
1055 POKE 709,0:? "   ESTIMATE RANGE"
1060 ? "  (IN 000'S of yards)"
1070 INPUT GUESS:BASE=50
1080 ? "K":IF GUESS>200 THEN ? "RANGE T
OO GREAT FOR YOUR GUNS!":GOTO 1070
1090 ? "RANGE ESTIMATED AT ";GUESS;"00
YARDS":FOR DE=1 TO 250:NEXT DE:RETURN
1095 IF FRITZ=0 THEN PRINT "ENEMY IS FI
RING!": FOR DE=1 TO 350:NEXT DE
1110 : IF STRIG(0)=0 THEN RETURN
1120 : GOTO 1110
4999 REM ******OPENING FIRE*******
5000 ? "K":POKE 708,254:POKE709,254:POK
E 710,254:REM *GUNFLASH*
5010 FOR DE=1 TO 20:NEXT DE:POKE 708,12
:POKE 709,2:POKE 710,10:REM **RESTORE CO
LOURS***
5020 FOR VOL=15 TO 0 STEP -1:SOUND 0,50
,0,VOL:SOUND 1,47,0,VOL:SOUND 2,67,0,VOL
5030 FOR DE=1 TO 25:NEXT DE:NEXT VOL
5040 FOR DE=1 TO 500:NEXT DE:RETURN
5050 REM*******ENEMY FIRES:***********
5060 ? "K":POKE 708,254:FOR DE=1 TO 15:
NEXT DE:POKE 708,12:POIKE 709,254:COLOR
2:PLOT SHIP,HORIZ
5070 FOR DE=1 TO 200:NEXT DE:POKE 709,2
:COLOR 3:PLOT SHIP,HORIZ
5080 RETURN
5085 REM******SHELL SPLASHES RISE******
5090 SPLASH=INT(RND(0)*65)+5:SPOUT=INT(
RND(0)*65)+85:SPRAY=SPLASH
5100 POKE 709,14:FOR COLUMN=1 TO 14
5110 ?"K":COLOR 2:PLOT SPOUT,BASE+10
5120 FOR DE=1 TO 5:BASE-1:NEXT COLUMN
5130 PLOT SPLASH,BASE+34:DRAWTO SPLASH,
BASE-22
5140 PLOT SPLASH +4,BASE+34:DRAWTO SPLA
SH+4,BASE-22:PLOT SPLASH+3,BASE+35:DRAWT
O SPLASH+3 BASE-25
5150 PLOT SPLASH+1,BASE+35:DRAWTO SPLAS
H+1,BASE-25
5160 PLOT SPLASH+2,BASE+35:DRAWTO SPLAS
H+2,BASE-29
5161 RETURN
5199 REM ********ENEMY SALVO********
5200 MARK=0
5210 IF EST<RANGE-7 THEN EST=EST+10:RET
URN
5220 IF EST>RANGE+7 THEN EST=EST-10:RET
URN
5230 IF EST<=RANGE+7 AND EST>RANGE THEN
 EST=EST-1:RETURN
5240 IF EST>=RANGE-7 AND EST<RANGE THEN
 EST=EST+1:RETURN
5250 IF EST=RANGE THEN MARK=MARK+1:GOS
UB 6000:RETURN
5299 REM ******INCOMING SHELLS SFX*****
5300 FOR PITCH=30 TO 55 STEP 1:SOUND 0,
PITCH,8,13:SOUND 1,PITCH+7,10,10:SOUND 2
,PITCH-6,4,14
5310 FOR DE=1 TO 4:NEXT DE:NEXT PITCH
5320 SOUND 0,0,0,0:SOUND 1,0,0,0,:SOUND
2,0,0,0:RETURN
5330 REM********EXPLOSION**************
5340 FOR VOL=15 TO 1 STEP -1:SOUND 0,50
,0,VOL:SOUND 2,53,0,VOL: FOR DE-1 TO 10:
NEXT DE
5350 NEXT VOL:SOUND 0,0,0,0:SOUND 1,0,0
,0:SOUND 2,0,0,0:RETURN
5359 REM ******REPORT SHOOT************
5360 POKE 709,0
5362 IF GUESS<RANGE THEN ? "K";"RANGE "
;GUESS;"00 TOO SHORT!":RETURN
5365 IF GUESS>RANGE THEN ? "K";"RANGE "
;GUESS;"00 TOO GREAT!":RETURN
5370 IF GUESS=RANGE THEN ? "K";"STRADDL
E!":GOSUB 5380:HIT=HIT+1:GOSUB 6000:RETU
RN
5379 REM*********ENEMY WEAVES***********
5380 CHASE=INT(RND(0)*2)+1:FOR DE=1 TO
500:NEXT DE
5390 IF CHASE=2 THEN RANGE=RANGE+1
5400 IF CHASE=3 THEN RANGE=RANGE-1
5410 RETURN
5499 REM ****ERASE SPLASHES***********
5500 FOR DE=1 TO 60:NEXT DE
5505 FOR COLUMN=1 TO 6
5510 COLOR 1:PLOT SPOUT,BASE+9:DRAWTO S
POUT+1,BASE+9:FOR DE=1 TO 9:NEXT DE:BASE
=BASE+1:NEXT COLUMN
5520 FOR COLUMN=1 TO 10
5530 COLOR 3:PLOT SPOUT,BASE+9:DRAWTO S
POUT+1,BASE+9:FOR DE=1 TO 9:NEXT DE:BASE
=BASE+1:NEXT COLUMN
5535 FOR COLUMN=1 TO 25
5540 COLOR 1:PLOT SPLASH,BASE-45:DRAWTO
 SPLASH+4,BASE-45
5550 BASE-BASE+1:FOR DE=1 TO 5:NEXT DE
5560 NEXT COLUMN
5570 COLOR 2:PLOT SPRAY,BASE-70:PLOT SP
RAY+2,BASE-68:PLOT SPRAY+3,BASE-63:PLOT
SPRAY+4,BASE-66
5580 PLOT SPRAY+2,BASE-60:PLOT SPRAY+3,
BASE-58:PLOT SPRAY,BASE-57:PLOT SPRAY+3,
BASE-38
5585 PLOT SPRAY,BASE-50:PLOT SPRAY+2,BA
SE-53:PLOT SPRAY+4,BASE-51
5587 PLOT SPRAY+2,BASE-45:PLOT SPRAY+4,
BASE-43:PLOT SPRAY,BASE-39
5590 FOR COLUMN=1TO 20
5600 COLOR 1:PLOT SPLASH,BASE-45:DRAWTO
 SPLASH+4,BASE-45
5610 FOR DE=1 TO 5:NEXT DE:BASE=BASE+1
5620 NEXT COLUMN
5630 BASE=50:FOR ERASE=1 TO 21
5640 COLOR 1:PLOT SPLASH,BASE-43:DRAWTO
 SPLASH+4,BASE-43
5650 COLOR 3:PLOT SPLASH,BASE+1:DRAWTO
SPLASH+4,BASE+1
5660 BASE=BASE+1
5680 NEXT ERASE:POKE 709,2:RETURN
5999 REM ********HIT RESULTS***********
6000 POKE 709,2
6010 IF MARK>=1 THEN READ P$:?"K";"YOU
HAVE BEEN ";P$
6020  IF HIT>=1 THEN READ T$:?"K";"THE
ENEMY HAS BEEN ";T$
6030 IF T$="SUNK!" THEN GOTO 12000
6040 IF P$="SUNK!" THEN GOTO 15000
6050 DATA HIT.HIT,DAMAGED,SLIGHTLY DAMA
GED,BADLY DAMAGED,SET ON FIRE,SEVERELY D
AMAGED
6060 DATA SUNK!,SUNK!
6070 FOR DE=1 TO 500:NEXT DE:?"K":RETUR
N
7999 REM ********TITLE SCREEN**********
8000 GRAPHICS 18:POKE 712,134:POKE 708,
0:POKE 710,14
8010 POSITION 7,2:?#6;"HUNT"
8020 POSITION 7,4:?#6;"THE"
8030 POSITION 7,6:?#6;"RAIDER"
8040 FOR DE=1 TO 400:NEXT DE
```

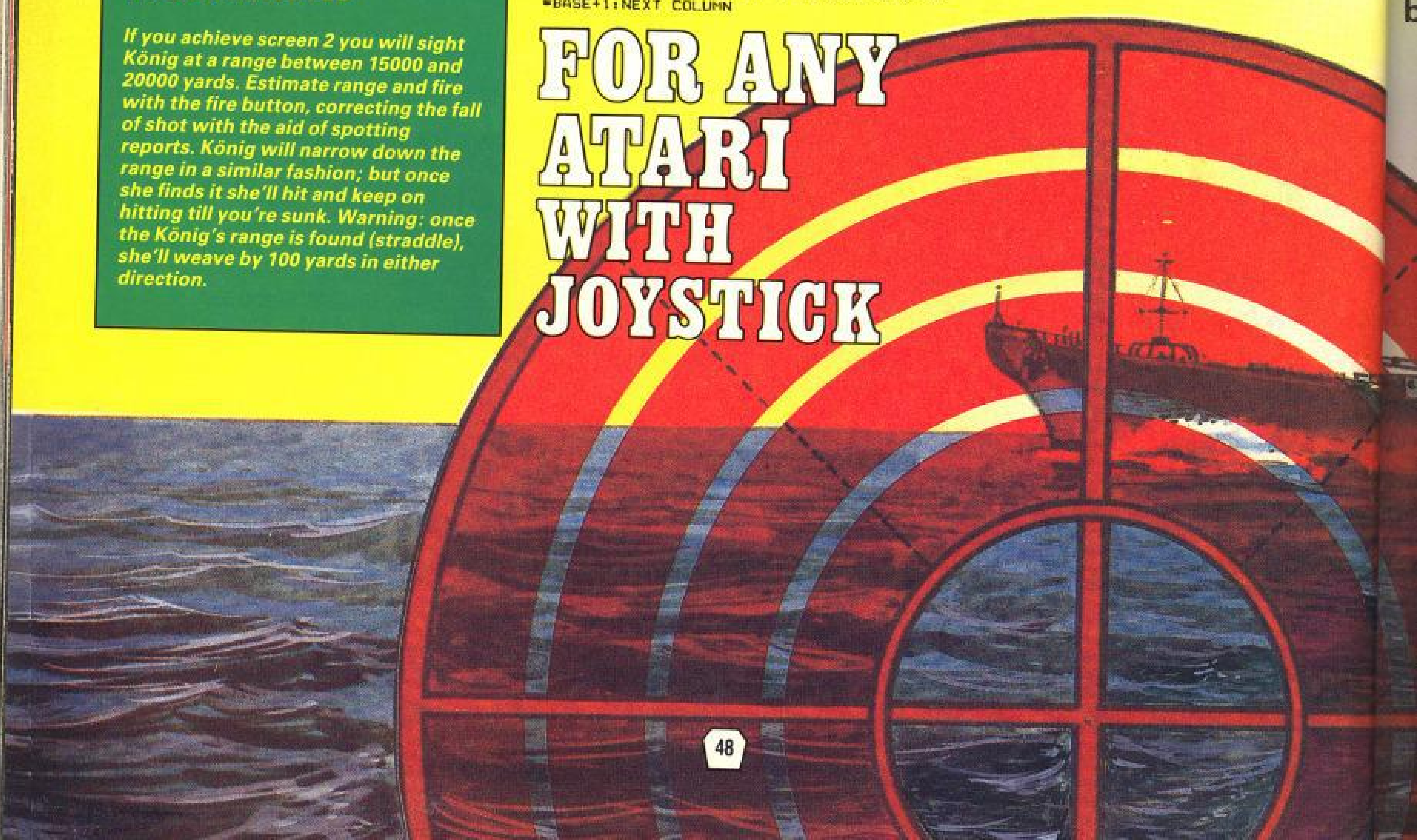
PROGRAM NOTES

If you achieve screen 2 you will sight König at a range between 15000 and 20000 yards. Estimate range and fire with the fire button, correcting the fall of shot with the aid of spotting reports. König will narrow down the range in a similar fashion; but once she finds it she'll hit and keep on hitting till you're sunk. Warning: once the König's range is found (straddle), she'll weave by 100 yards in either direction.

HUNT

b

FOR ANY ATARI WITH JOYSTICK

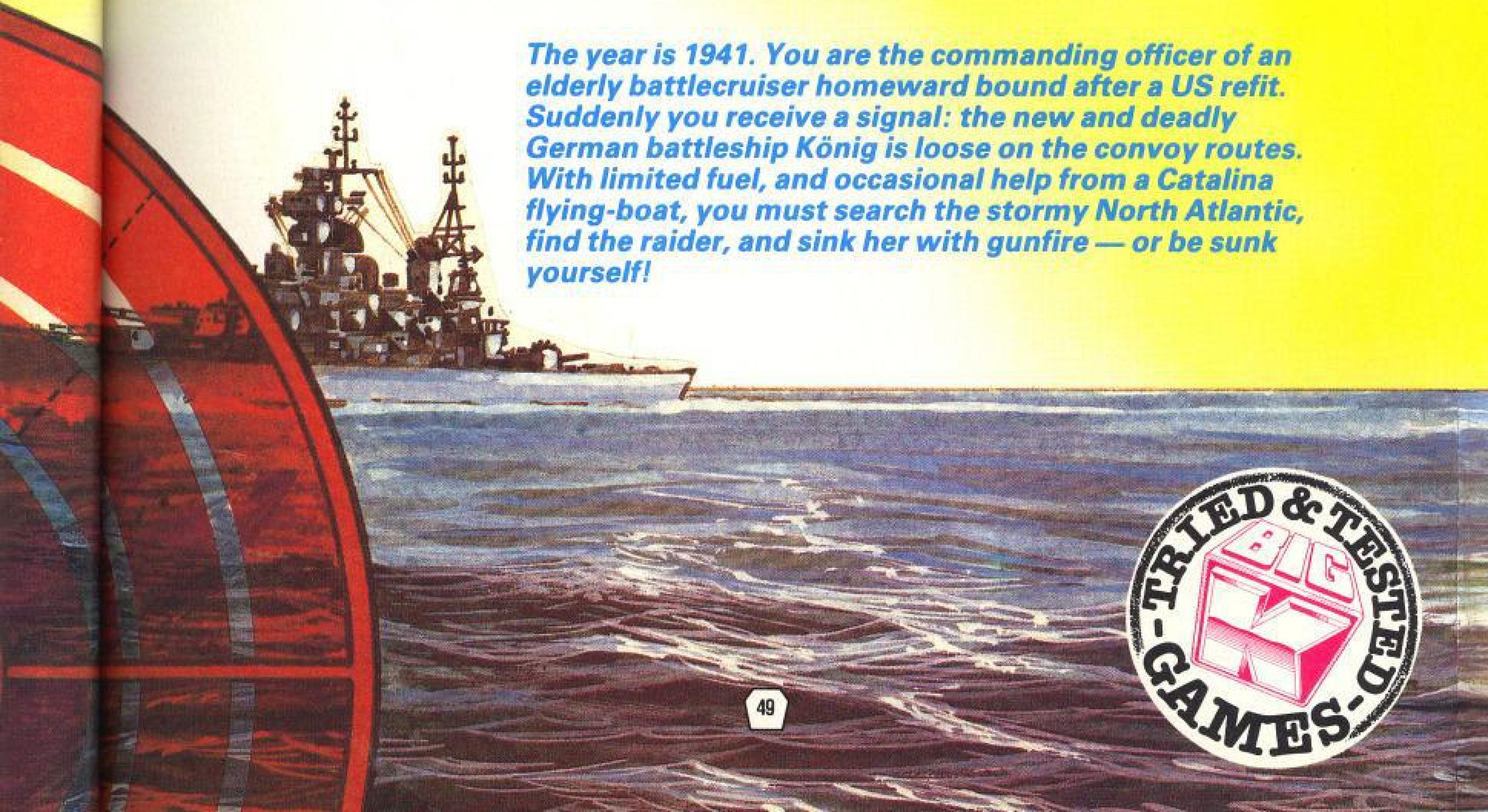


```
8050 POSITION 1,10:?#6;"PRESS START TO
PLAY"
8060 IF PEEK(53279)=6 THEN RETURN
8070 GOTO 8060
9000 REM *******HIDE AND SEEK*********
9100 GRAPHICS 3:POKE 752,1:POKE 712,134
:POKE 712,134
9110 POKE 708,0:REM ENEMY SHIP COLOUR
9120 POKE 709,14:REM YOUR SHIP COLOUR
9140 LONG(1)=INT(RND(0)*39):LAT(1)=INT(
RND(0)*19):LONG(2)=INT(RND(0)*39):LAT(2)
=INT(RND(0)*19)
9145 IF MOVE=0 OR MOVE=5 THEN HIDE=1:MO
VE=0:SEARCH=SEARCH+1:?"CATALINA SIGHTS E
NEMY!":GOTO 9149
9146 HIDE=3
9149 IF SEARCH=6 THEN GOSUB 20000:CLR:R
UN
9150 COLOR HIDE:PLOT LONG(1),LAT(1):COL
OR 2:PLOT LONG(2),LAT(2)
9160 ?"COURSE?(N,NE,E,S,SW,SE,W,NW or N
ONE)"
9170 INPUT COURSE$
9190 IF COURSE$="N" THEN GOSUB 9290:LAT
(2)=LAT(2)-1:GOTO 9310
9200 IF COURSE$="NE" THEN GOSUB 9290:LA
T(2)=LAT(2)-1:LONG(2)=LONG(2)+1:GOTO 931
0
9210 IF COURSE$="E" THEN GOSUB 9290:LON
G(2)=LOG(2)+1:GOTO 9310
9220 IF COURSE$="SE" THEN GOSUB 9290:LO
NG(2)=LONG(2)+1:LATR(2)=LAT(2)+1:GOTO 93
10
9230 IF COURSE$="S" THEN GOSUB 9290:LAT
(2)=LAT(2)+1:GOTO 9310
9240 IF COURSE$="SW" THEN GOSUB 9290:LA
T(2)=LAT(2)+1:LONG(2)=LONG(2)-1:GOTO 931
0
9250 IF COURSE$="W" THEN GOSUB 9290:LON
G(2)=LONG(2)-1:GOTO 9310
9260 IF COURSE$="NW" THEN GOSUB 9290:LO
NG(2)=LONG(2)-1:LAT(2)=LAT(2)-1:GOTO 931
0
9270 IF COURSE$="NONE" THEN GOTO 9310
9280 GOTO 9170
9290 COLOR 3:PLOT LONG(1),LAT(1):PLOT L
ONG(2),LAT(2):FOR DE=1 TO 200:NEXT DE:?"
↰"
9300 SOUND 0,TONE,10,4:FOR DE=1 TO 100:
NEXT DE:SOUND 0,0,0,0:TONE=TONE-5:RETURN
9310 HUN=INT(RND(0)*9)+1
9320 IF LONG(1)=39 THEN LONG(1)=38
9330 IF LONG(1)=0 THEN LONG(1)=1
9340 IF LAT(1)=19 THEN LAT(1)=18
9350 IF LAT(1)=0 THEN LAT(1)=1
9355 IF LONG(2)<0 OR LONG(2)>39 OR LAT(
2)<0 OR LAT(2)>19 THEN ?"↰";"ILLEGAL MOV
E!":GOTO 9170
9360 IF HUN=2 THEN LAT(1)=LAT(1)+1
9370 IF HUN=3 THEN LAT(1)=LAT(1)-1
9380 IF HUN=4 THEN LONG(1)=LONG(1)+1
9390 IF HUN=5 THEN LONG(1)LONG(1)-1
9400 IF HUN=6 THEN LONG(1)=LONG(1)-1:LA
T(1)=LAT(1)-1
9410 IF HUN=7 THEN LONG(1)=LONG(1)-1:LA
T(1)=LAT(1)+1
9420 IF HUN=8 THEN LONG(1)=LONG(1)+1:LA
T(1)=LAT(1)+1
9430 IF HUN=9 THEN LONG(1)=LONG(1):LAT(
1)=LAT(1)+1
9440 IF LONG(1)>=LONG(2)-1 AND LONG(1)<
=LONG(2)+1 THEN GOTO 9450
9445 GOTO 9460
9450 IF LAT(1)>=LAT(2)-1 AND LAT(1)<=LA
T(2)+1 THEN GOTO 9500
9460 MOVE=MOVE+1:GOTO 9145
9500 COLOR 1:PLOT LONG(1),LAT(1):COLOR
2:PLOT LONG(2),LAT(2):?"↰";"CONTACT!":FO
R DE=1 TO 500:NEXT DE:RETURN
10999 REM******CLOBBERED!*************
11000 POKE 708,0:POKE 709,0:POKE 710,0:?
"↰":FOR DE=1 TO 10:NEXT DE:POKE 708,254:
POKE 709,254
11010 FOR DE=1 TO 10:NEXT DE:POKE 708,12
:POKE 709,14:POKE 710,10
11020 RETURN
11999 REM *****ENEMY BLOWS UP**********
12000 COLOR 1:PLOT SHIP,HORIZ
12010 POKE 709,254:COLOR 2:PLOT SHIP,HOR
IZ
12020 FOR DE=1 TO 200:NEXT DE
12025 FOR FLAME=1 TO 3
12030 HORIZ=HORIZ-1
12040 PLOT SHIP,HORIZ
12050 FOR DE=1 TO 100:NEXT DE:NEXT FLAME
12055 COLOR 1:PLOT SHIP,HORIZ+3:FOR DE=1
 TO 200:NEXT DE
12057 PLOT SHIP-1,HORIZ+3
12058 PLOT SHIP+1,HORIZ+3
12060 PLOT SHIP,HORIZ+2:FOR DE=1 TO 50:N
EXT DE
12070 PLOT SHIP,HORIZ+1:FOR DE=1 TO 50:N
EXT DE
12080 PLOT SHIP,HORIZ:FOR DE=1 TO 50:NEX
T DE
12085 FOR SMOKE=1 TO 10
12090 COLOR 3:PLOT SHIP,HORIZ-3
12100 FOR DE=1 TO 25:NEXT DE
12110 COLOR 1:PLOT SHIP,HORIZ-3
12120 HORIZ=HORIZ-1:NEXT SMOKE
12130 POKE 709,2
12140 SOUND 1,250,0,1:SOUND2,249,0,1
12150 FOR DE=1 TO 350:NEXT DE
12160 SOUND 1,0,0,0,:SOUND 2,0,0,0:SOUND
 3,0,0,0
12170 ?"↰";"THE ENEMY HAS BLOWN UP!"
12180 ?"YOU HAVE SUCCEEDED IN PRESERVING
";"THE SEAWAYS OF THE EMPIRE"
12190 FOR DE=1 TO 400:NEXT DE
12200 ?"↰";"JOLLY WELL DONE!"
12210 GOSUB 20030:CLR:RUN
14999 REM*******SINKING*****************
15000 GRAPHICS 19:POKE 708,0:POKE 709,15
2:POKE 710,152:POKE 752,1
15010 SOUND 3,20,0,4
15020 FOR DE=1 TO 450:NEXT DE
15030 HORIZ=0:VERT=23
15040 COLOR 2:FOR LOOP=1 TO 12
15050 PLOT HORIZ,VERT:DRAWTO HORIZ+39,VE
RT:FOR DE=1 TO 75:NEXT DE:VERT=VERT-1
15060 PLOT HORIZ+39,VERT:DRAWTO HORIZ,VE
RT
15070 VERT=VERT-1:FOR DE=1 TO 40:NEXT DE
15075 NEXT LOOP:SOUND 0,0,0,0
15080 GRAPHICS 0:POKE 752,1:POKE 710,152
:POKE 712,152:POKE 709,14
15090 FOR DE=1 TO 200:NEXT DE:?"↰":?:?:?
:?"YOUR SHIP WAS REPORTED LOST TODAY,"
15100 ?:?"AFTER BLOWING UP AND SINKING":
?:?"AS A RESULT OF GUNFIRE"
15110 FOR DE=1 TO 500:NEXT DE
15120 ?:?:?"REQUIESCAT IN PACE"
15130 GOSUB 20030:CLR:RUN
15140 END
19999 REM *****OUT OF FUEL**************
20000 ?"↰";"YOU ARE RUNNING OUT OF FUEL"
:?"AND MUST RETURN TO DASE"
20010 FOR DE=1 TO 500:NEXT DE:?"↰";"BAD
LUCK!"
20020 FOR DE=1 TO 450:NEXT DE:?"↰";"ESPE
CIALLY ABOUT THE COURT MARTIAL!"
20030 FOR DE=1 TO 500:NEXT DE:?"↰";"ANOT
HER GAME? (y/n)"
20040 INPUT Y$
20050 IF Y$="Y" THEN RETURN
20060 END
```

T THE RAIDER!

by NAUTICUS

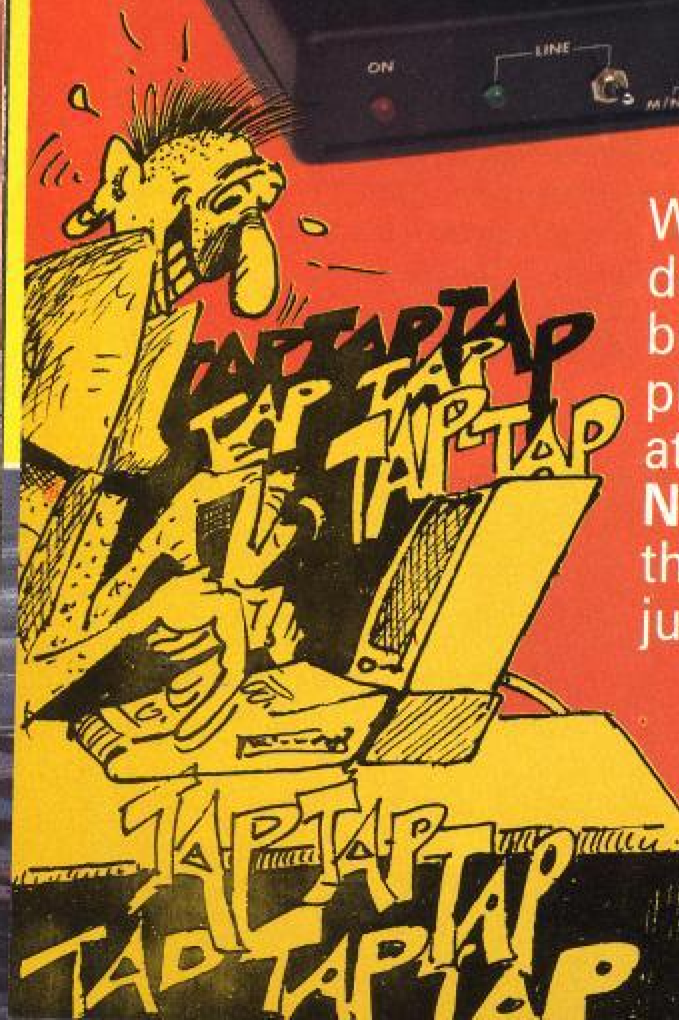
The year is 1941. You are the commanding officer of an elderly battlecruiser homeward bound after a US refit. Suddenly you receive a signal: the new and deadly German battleship König is loose on the convoy routes. With limited fuel, and occasional help from a Catalina flying-boat, you must search the stormy North Atlantic, find the raider, and sink her with gunfire — or be sunk yourself!



TRIED & TESTED BIG K GAMES



THOSE SHIFTING



What is a Modem and how does it differ from a cheeseburger? Is 'Acoustic Coupling' something rude done at high volume? **RICHIE NEWMAN** steers us through the Telecommunications jungle . . .

BECOME A MICRO trendy! Communicate! It's the latest craze (we're told) and everybody's doing it — so get out there and do it too.

What for? You may well ask. With who? Why? And — more to the point — what's in it for me? Or slightly more positive — how?

How? OK, you just connect your micro to the phone line by using a modem. Simple. Well, almost simple. The truth is that there are several different types of modem at several different types of price. The price, in fact, can vary from around £50 to well over £200, so it's worth working out first exactly what you aim to do with the modem (within reason) and how much you can afford (or alternatively, who you can touch for the cost).

The word 'modem' is an abbreviation of modulator/demodulator. The gadget itself translates the signals coming out of the micro, (which are digital) into analogue signals, which then travel serially down the phone wires and back again. So by using the telephone network, a modem and your micro, you get to communicate with other micro users, as well as vast databases

WHISPERING WIRES...

held on mainframe computers.

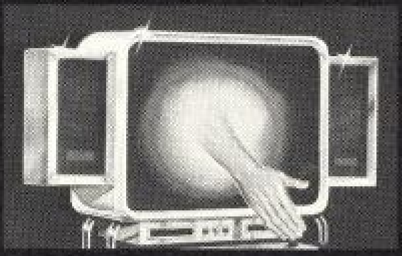
There are two basic types: acoustic and direct-connect. Acoustic modems have tended, to date, to be cheaper than the direct-connect variety. They are shaped into rubber or plastic sockets into which you jam your telephone handset ear and mouth pieces. A word of warning here — if you have a Trimphone, a Mickey Mouse phone, or any other weird telephonic instrument, then your chances of successfully stuffing the handset into an acoustic modem are pretty slight — or more accurately, impossible. So, you have to have a standard British Telecom issue phone, called a series 700, for a kickoff. But other than that, any micro with an RS232 or equivalent serial interface port is on its way. (If your micro doesn't have an interface as standard, fear not, the gap has been spotted and plenty of sterling can be made by manufacturing and selling interfaces for the likes of the Dragon or Spectrum).

There is a wide variety of acoustic modems on the market which, despite varying considerably in price, don't necessarily vary equally considerably in quality. Among the more expensive (and some say the best) are the A211 and AJ311 from Anderson Jacobson. The



A211, cost £229, has rotating rubber cups (!) which can be moved into different positions to accommodate different shaped handsets (still no Trimphones though), as well as allowing both full-duplex (which means that two-way communication is possible simultaneously) and half-duplex (where you can only communicate in one direction at a time). The AJ311 costs £279 and comes with extra features, including something called 'echo' which tones down unwanted noise on the line.

Thereby hangs another tale. One of the major problems for acoustic modems is noise, whether it's on line, or simply in the room you happen to be in (so don't sit in the kitchen with the washing machine on or near anyone who's taken to drilling holes in the plasterwork). Noise, unfortunately, interfaces with the signal transmission, and you can end up with considerable amounts of garbage on your screen.

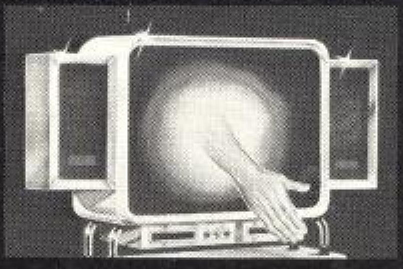


At the lower end, cost wise, of the acoustic market, modems include the Networking Interface from Prism Technology Holdings at £60.10 and the build-it-yourself acoustic kit from Maplin Electronics, at £50.

Variations in price, however, are not the only difference between modems. No, sir. There is also such a thing as a baud rate — the frequency at which messages are transmitted — the higher the frequency, the faster the transmission. There are two most commonly used rates: 1200/75, which means information is sent at 75 baud and received at 1200 baud; and the 300/300 rate (work it out for yourself). The former is the one used by Prestel to communicate with its enormous database, while the latter is most commonly used to communicate from one micro to another, or to the evergrowing number of micro bulletin boards around the country. So, for instance, the Networking Interface, which has a baud rate of 1200/75, is great for getting into Prestel and its attendant services like Micronet 800 or Viewfax 258 — but no use at all if you want access to other micro enthusiasts, via the bulletin boards. Whereas the 300/300 baud kit from Maplin presents you with the problem in reverse. On top of that, once you've built your modem from a kit, you have to trot off and get it approved by British Telecom — because if you don't, chickadeess you're breaking the law. (This is to make sure that the correct signals are sent down the lines, otherwise it could be pretty dangerous).

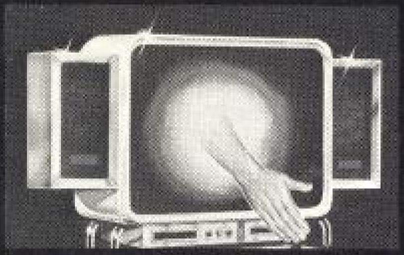
These regulations, baud rates and duplex modes also apply to direct-connect modems. In their case, they are connected directly to the phone wire, usually via a jack socket which BT has to install for you (cost around £25-£28 — they don't take kindly to people hard-wiring their kit into BT lines). Direct connect modems tend to be more expensive than their acoustic counterparts, though the price of everything connected with the micro market is dropping so fast that who knows what will have happened by the time this is published? Direct connectors do, however, have the distinct advantage that they don't suffer from noise interference as they are plugged directly into the lines.

Scicon has just zapped into the market with its Buzzbox (they probably took months to come up with that name) which for £69.50, gives you direct connect on 300/300 baud. (You'll have to cough up an extra £9.50 for a mains adapter if you don't just want to run it off the batteries, though.) Prism pops up again in the direct connect market with a range of modems, including the VTX5000, at £99.95 (specifically designed for Spectrum) and the Modem 1000 at £69.95 inc vat (for a number of other micros). The Prism direct connect modems, like the acoustic, operate at 1200/75 for access to Prestel and other private viewdata services. The modems do have a switch which allows you to change from 1200/75 full



duplex to 1200/1200 half duplex to communicate direct user to user — but, so far, Prism haven't come up with the software to allow you to do this.

So now you've got your modem and your software and it's all suitably approved. But in buying it you'll have had to decide what you want



to access with it. So it might be best to read this article in reverse, 'cos here's the 'what's in it for me' section.

There's Prestel, for one. A vast database that was looking pretty shaky till the micro boom livened things up a bit. As well as its own information — covering most things from airport flight departures and arrival-times to prices on the stock exchange — a number of 'Information Providers' also offer their wares on Prestel. These include Micronet 800 which offers telesoftware (both free and charged) which can be downloaded from the screen into your micro, its own mailbox for exchange of messages (beware, they are censored) and an electronic magazine on the computer industry. For micro users, it's actually a pretty good service, though it will cost you £32 a year to subscribe to Micronet, plus £5 a quarter for Prestel. (Plus the phone bill). There is also Viewfax 258, an open database which offers software, and views and news on the micro scene, and is the home of the infamous MicroGnome who is no respector of anything.

Now for the 300/300 baud lot, which really means bulletin boards. They are all free and provide a forum for messages and notices, often of particular interest to the micro hobbyist covering kits for sale, programming hints, general tips, personal messages and libraries of free softare. Bulletin boards are not just limited to the UK. As most of Europe uses the same telephone frequency standards set down by the Consultative Committee for International Telegraph and Telephone (CCITT — but I still had to explain), bulletin boards in Sweden, for instance, are at your disposal.

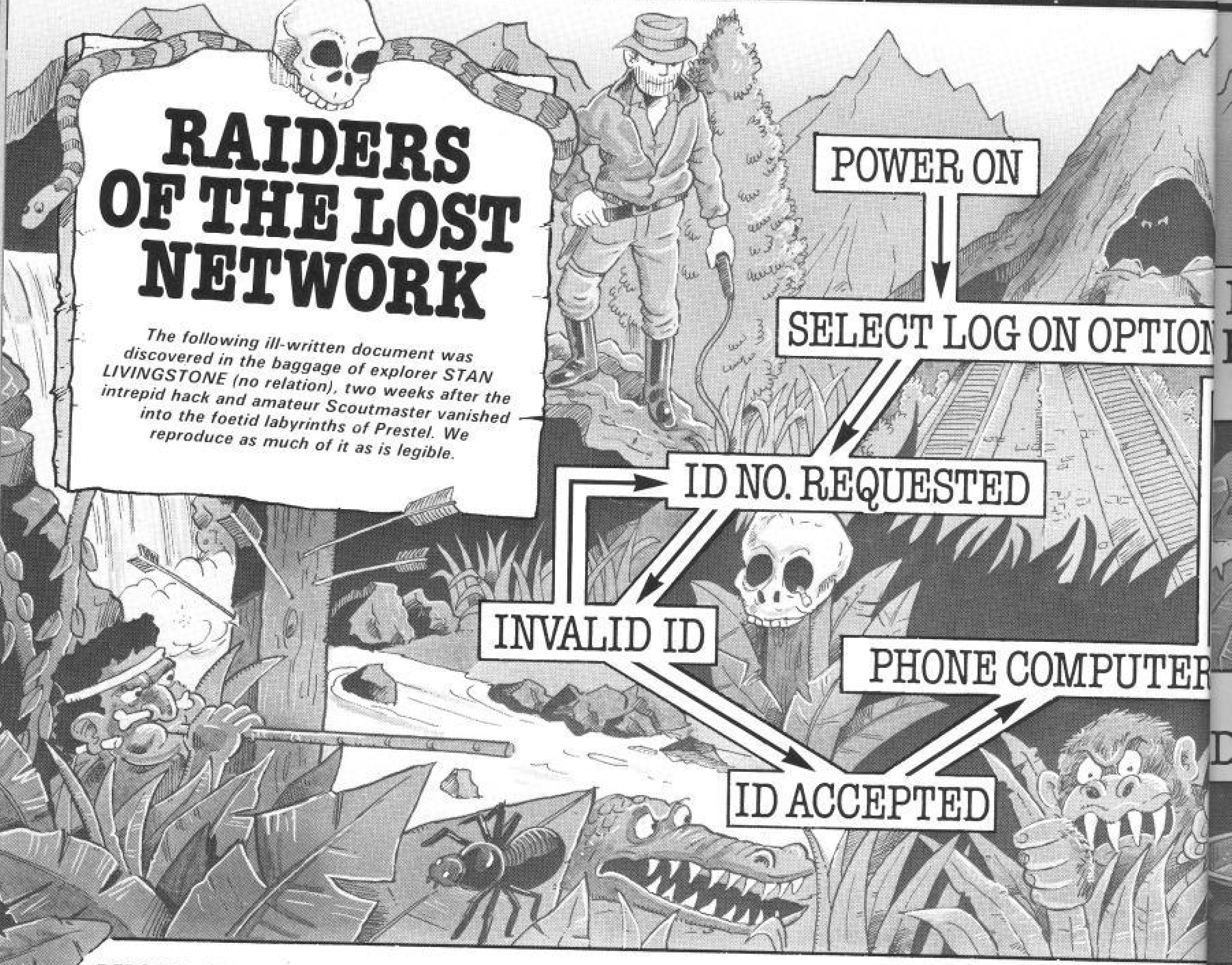
The USA however, is no good.

Let me re-phrase that. You can't access US bulletin boards because they use different frequencies.

Clear now?

RAIDERS OF THE LOST NETWORK

The following ill-written document was discovered in the baggage of explorer STAN LIVINGSTONE (no relation), two weeks after the intrepid hack and amateur Scoutmaster vanished into the foetid labyrinths of Prestel. We reproduce as much of it as is legible.



REPORTS OF the fabled realm of Micro-net had been circulating amongst the computer-literate for some time. People said to have discovered it had mysteriously disappeared from society. I was determined to find this legendary place and expose the myth as a lie.

DAY 1

Left base camp full of optimism and good cheer. Carruthers waved farewell and wished me luck. The Spectrum felt good in my hands, the Prism VTX5000 modem nestled comfortably underneath it — the key, I was told, to the gates of Micro-net.

Reached the appointed spot and turned on the Spectrum. The modem's built-in ROM-based software requested input of my ID number. Fed in the code Carruthers had supplied. Couldn't believe eyes. The screen flashed INVALID ID at me. Desperately tried several combinations of the number. Nothing. The barrier between myself and Micro-net stood firm. I had been given . . . the wrong ID!

Returned to camp in a foul mood, cursing Carruthers.

DAY 2

Set out again, this time armed with all the necessary codes. (Carruthers learning to live with his disability well.)

Reached the spot and repeated yesterday's procedure. ID accepted this time and the screen flashed PHONE COMPUTER. I dialled the special phone number. Ringing tone, then a high-pitched sound. I was in contact! Flipping the switch on the front of the modem brought a green LED. I replaced the handset; the VTX5000 was now directly linked to the distant mainframe. A screen display appeared before me asking for my personal entry code. I gave it. Suddenly the barrier cleared and yelling the traditional hacker war-cry of "I'M IN!", I plunged into the legendary database . . .

Nothing could have prepared me for what I saw. It was vast. I realised that the fabled Micro-net was merely one small part of a much mighter database, called, in the local tongue, 'Pres-Tel'. How could such an awesome entity have remained undiscovered for so long? Access to all this lay before me through my humble Spectrum. I had discovered a new, untapped source of Knowledge.

Ahead of me was spread over half a million pages of information, each with a dozen or more branches trailing off into the unknown. Within Micro-net — 40,000 pages on its own — I could see databases around me for explorers from other microcomputers. I decided to stay on that trail called Sin-Clair.

I was aware of activity, lots of it. The natives were constantly communicating with each other or with Micro-net. Much trading was taking place with all manner of goods on sale through devices known as 'response pages'. These operated through the input of a personal code number. The information was then flashed to the trader who despatched the goods to the native. Incredible.

By far, the most sought-after commodity was software. Micro-net held large stocks of this which could be downloaded into an individual's micro on request. Silicon Bush Telegraph.

I was in a jungle of menu's, flashing signs and indicators advising me to 'GOTO' this or that page where I would find exciting things.

I ventured into Micro-net a few pages at a time. I found a wealth of information; news, reviews, technical help, classified ads, letters from natives. I found a list of software that could be downloaded. Much of it was free, but some had charges that would automatically be placed on a native's account. Was amazed to find such familiar items as *Manic Miner* and *The Hobbit* available for downloading and incredibly cheap prices (£6 for *The Hobbit*). The natives had certainly set themselves up well.

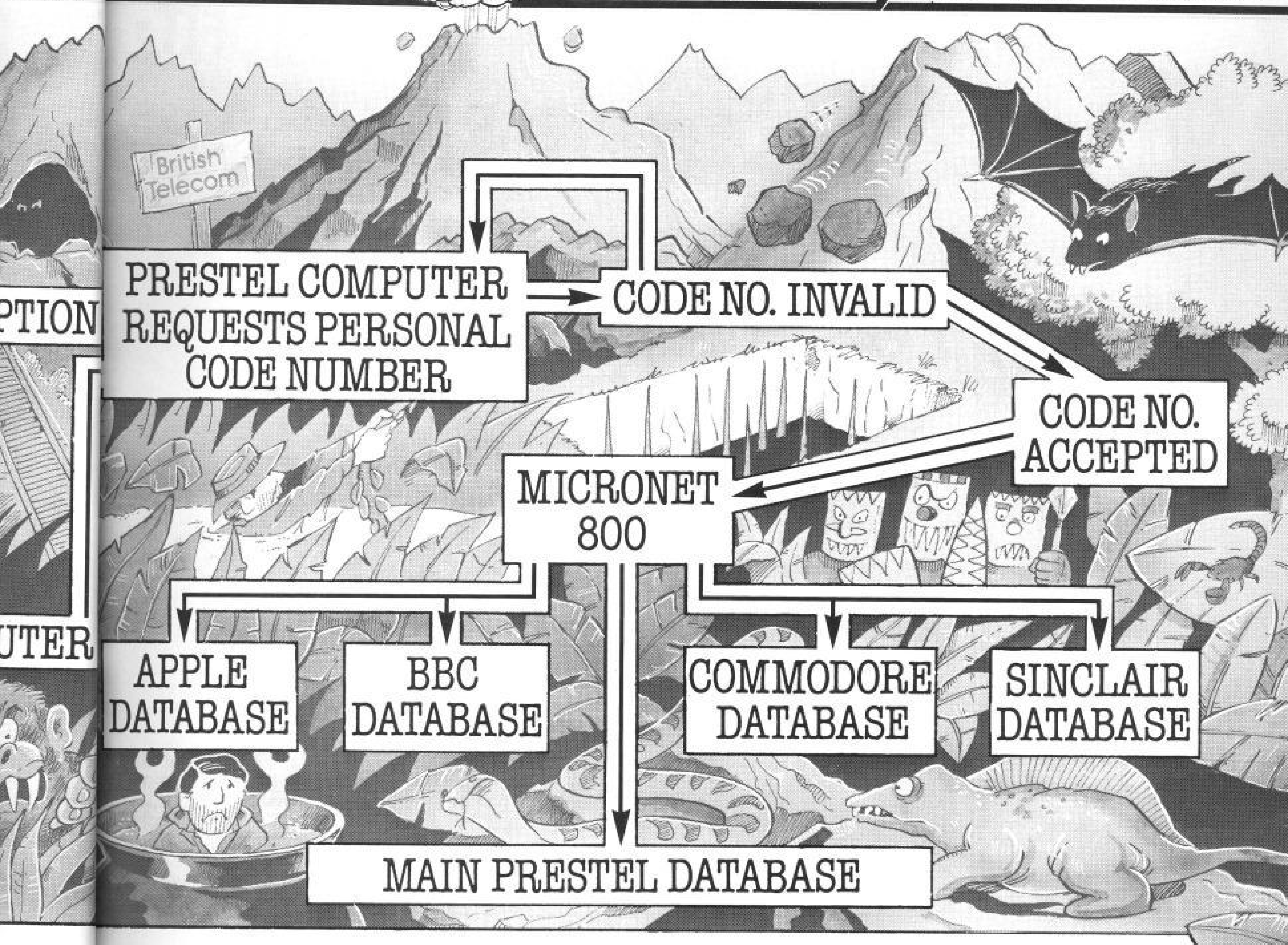
It was getting late, Carruthers would be worried. Calling up the menu I 'logged off'.

On my return Carruthers congratulated me on now owning British Telecom. I patted him sympathetically on the head with my croquet mallet and explained that most calls to Micro-net were charged at the cheap rate from most parts of the country at off-peak times.

DAY 3

Woke early to spend as much time as possible exploring Micro-net. Carruthers still asleep, my breakfast not ready. Gently rolled his sleeping bag into the lake to wake him up.

Returned to the database and set off boldly through the pages, finding the menu-driven routes easier to follow. Each page I came to could have as many as 26 sub-pages, or branches splitting off. Whole sections had been rented by various companies to adver-



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On my travels I came across amazing sights:

A gathering place for various computer clubs called "Clubspot". The start of a mammoth strategy/tactical game for up to 1,000 players, each feeding their moves into Micro-net via their computers. A group of natives forming a "Computers For Peace" movement. An adventure game HELP section. The popular mailbox service which enables natives to leave messages for each other. A damning review of the new Sinclair QL's keyboard. Constantly updated news-flashes. And so much more.

I had had the foresight to bring my printer along and, using the 'Print frame' option, made good use of it printing out many of the these astounding sights. (I had to have proof of my discoveries. My only fear was that my paper supply would not hold out.)

Late in the day I bagged my first piece of software. I selected an easy target, a free game. Finding the appropriate page I called up the 'Downloader menu' from the VTX5000, keyed a number and the game came hurtling down the wires into my Spectrum. The whole operation took a few minutes as the program was transmitted a page at a time, 35 in all. I saved the game onto tape and ran it. Not bad quality at all. (It'll make a good trophy for the den wall.)

All the while I was exploring Micro-net I was aware of the vast territory called *Pres-Tel* surrounding me on all sides. I knew I would sooner or later have to face it. I decided it would be tomorrow. Logging off Micro-net I returned to camp and slept fitfully.

DAY 4

Left camp in an uneasy mood. The enormity of my mission weighed heavily on me.

Entered Micro-net through the by now familiar routine. Coming to the main menu page I struck off onto the route marked 'Pres-Tel' by keying in a number.

Seconds later I was into the main *Pres-Tel* database. 'Awesome' hardly described it. At my fingertips lay a staggering half a million pages of information and services. Almost every conceivable human need was catered for — from finding a plumber to playing the stock market.

Nervously I ventured forth, choosing my routes carefully. This was not easy because even the indexes had indexes!

The wealth of data almost boggled my mind: world news, business, travel, entertainment, interactive games, goods and services for sale — and that hardly scratched the surface.

I found that the natives had formed tribes called IPs or 'Information Providers'. Each tribe had established its own territory with large blocks of pages devoted to different subjects. It was here I came unstuck.

Following the menu-driven routes was easy while there were 'signposts' back to the main Pres-Tel index. But as I wandered into IP territory the signposts changed, leading only back to the particular tribe's main menu or entry point. All the landmarks I had noted vanished. The realisation suddenly hit me . . . I was lost!

Panic-stricken I took the emergency escape route — I logged off the system.

Returned to camp, dejected. Carruthers seemed amused at my predicament but stopped when he injured his good leg on my foot.

DAY 5

Back in the land of Pres-Tel. After much consideration I had, in the parlance of the computer-literate, 'cracked it'! Careful study of the system manual had shown the secret of the Spectrum's SYMBOL SHIFT and ENTER keys.

Used together with a particular page number they enabled me to get to that page from anywhere in the Pres-Tel system. So '*1 (then ENTER)' would immediately zap me back to Pres-Tel main menu from wherever I was.

I now have the key to deep exploration of the Pres-Tel and Micro-net databases. Incredible wonders lie ahead of me. The climax of my distinguished career has begun. I set off full of hope. I may never return!

Editor's Note:

This was the last heard from Stan Livingstone (no relation). He vanished without trace the following day (not easy, considering that there was 16 stone of him). His faithful assistant Carruthers remains at base camp loyally holding out hope that one day his master may return from the electronic jungle.

BE A KERRY* FOR FUN, PROFIT – AND A FIVE YEAR STRETCH

NOT EVERYTHING that glisters is gold, never more true than when you scrutinise the supposed security of telecomunications systems. If the Bank of England's gold reserves were as well guarded as the details on most on-line databases then we'd all be very poor.

British Telecom's Gold electronic mail system appeared more than a little tarnished on making its live TV debut on BBC's *'Microlive'* special one Sunday morning last autumn. The Hackers had struck! They'd apparently blocked legal access by OWL001 in a stunt which really spoiled the show.

And, on Horizon *'In The Wires'* programme a few months later, an American 'hackette' or female hacker described how she was offered large sums to crack databases holding details of Princess Di's spending on a visit to the States — by British pressmen anxious to find out what she'd been buying.

Now there are two bits of jargon here that need definition — the first's about talking to who you like in the world using your personal computer . . . and the second is a kind of electronic eavesdropping.

Rod O'Connor from the multinational chip supplier Motorola also reckoned that getting into those wires is cheap — all the kit you'd need to crack the most sophisticated telecommunications systems, say those used in banks, "would cost less than $1,000."

A 'live' example of how easy it is to hack open electronic mail — perhaps the first-ever on TV — came when the highly improving Beeb had Acorn man John Coll, otherwise known as OWL001, to dial-up the BT Gold computer's central database. He tapped in in his Absolutely Private And Confidential password ("BBC") to be greeted, *not* by the BT Gold logo . . . but by a fake "Illegal Access Warning!", and a great deal of derisory bleeping from the BBC micro he was using at the time.

Well! Micro-buff Guy Kewney has since revealed how the brown stuff really hit the fan: "In the subsequent inquest, the BBC accused Gold of doing it as a publicity stunt, Gold accused the BBC of doing the same thing, and two suspected programmers were bumped off the system forever, having their identities 'devalidated.' "

And all this because somebody played a joke? The authorities, especially in the States, are apt to get very heavy with hackers in order to dissuade the younger and more disaffected element in the personal computing fraternity from ever trying to break into any system. Of course, the net result has been just the opposite: hackers are now a subcult across the Atlantic.



Higgins? They've been in again!

Dr Charles Wood of the Stanford Research Institute, at one of the high-powered Universities which produced a majority of the people now working in Silicon Valley, is studying the phenomenon: "We're encouraging the numbers of people who now call themselves hackers by treating them as if they were criminals," he said.

Dr Wood described how what the California papers dubbed "The Hackers Trial" last year saw several "juvenile systems hackers, plain, ordinary middle-class kids found guilty of a felony — they, or their parents, ended up paying $250,000 in damages since the systems entire operating systems had to be regenerated from the ground up! And they were only just playing around with the system, albeit leaving graffiti."

Another (unnamed) then described in vivid detail how he had personally accessed the *War Games* military telecoms network (a sort of big brother to BT Gold/electronic mail), called the Arpanet, which was the film's basis in fact and had more or less "walked straight through all the security controls." Just as in the film, the Arpanet was so user-friendly that it positively encouraged him to proceed.

"Eventually I logged on as a guest of the Norwegian Seismic Array processor" (a hell of a long way from the West Coast University where he was sitting!), "and on that system we could look at the locations of all the Russians' underground missile test sites that the US military had found," said this unrepentant hacker.

"99 per cent of hackers could never even get started if people just followed the most basic commonsense rules — like changing the passwords regularly," reckoned American computer security consultant Michael Nye.

One female West Coast hackette, Susan Henley — apparently using a nifty 32-bit rig from the rather aptly-named Fortune Systems — said that getting the password was normally a "piece of cake." She'd call up the organization whose database she wanted to crack "and just ask for the codes, saying I'm an employee, ummh, and I've er, y'know . . . forgotten the password. And most of them give it out without even asking who you are, or why you want to know," she said.

Did she hack open the American Express database for British newspapers? "No, they didn't want to offer me enough money to do that," added Henley.

Hacking's a piece of cake according to Guy Kewney. "A quick browse through other people's pages (quite by accident, of course!) will show you that contracts are set up, draft memos exchanged between executives in the same organization but on different sites, and notes are kept.

"Other people's pages? That is one problem which Gold users are not ready for — hackers," Kewney continues. "Typically, somewhere in the files created by each user is a copy of a letter, written from somebody in Gold, telling the user of the password they can make available, temporarily, to a client. 'Tell them to use ID MKD 123, and the password HACK,' the message might say.

"This identity may be long abandoned, but the password may still be valid. And on this file, you are likely to find thousands of old letters, on similar subjects," according to Kewney — who is quoted here not by way of example, but to warn just how easy it can be to have your electronic mail opened and read by any half-intelligent Tom, Dick . . . or Hacker!

Hacking's a serious business — as the BBC has amply tried to demonstrate through both documentary of how it has been done unto other — and a live experience of its own. But a criminal offence? If you get caught trying to enter a bank's telecoms system then it'd be considered attempted robbery in America, though the position is less clear through lack of anybody having done it over here . . . or at least being caught!

At the start of 1983 Lloyd's Bank, Holborn branch was robbed of several million pounds, unspecified deposits and some gold. Detectives working on the still unsolved case later found that a GPO leased line between Lloyd's computer centre and the branch had been tampered with. It appeared as if a gang of thieves of above average intelligence had intercepted the command line to the bank's vault!

Without breaking the control 'alarm' circuit these high-tech thieves had obviously monitered the electronic pulse which the computer centre transmitted to the branch every morning to open the six-inch thick steel doors of the vault. Waiting until the weekend, they had mimicked this pulse and — open sesame — walked straight into the vault. Back at the Lloyd's HQ, and also at the City Police station which most banks also have links into, nothing stirred the systrem — the thieves had also mastered the "all-quiet" signal!

PAUL WALTON



*__Kerry__ s.f. Kerry Packer, i.e. __Hacker__ (q.v.) or computerised trespasser. Derog.

IVIN

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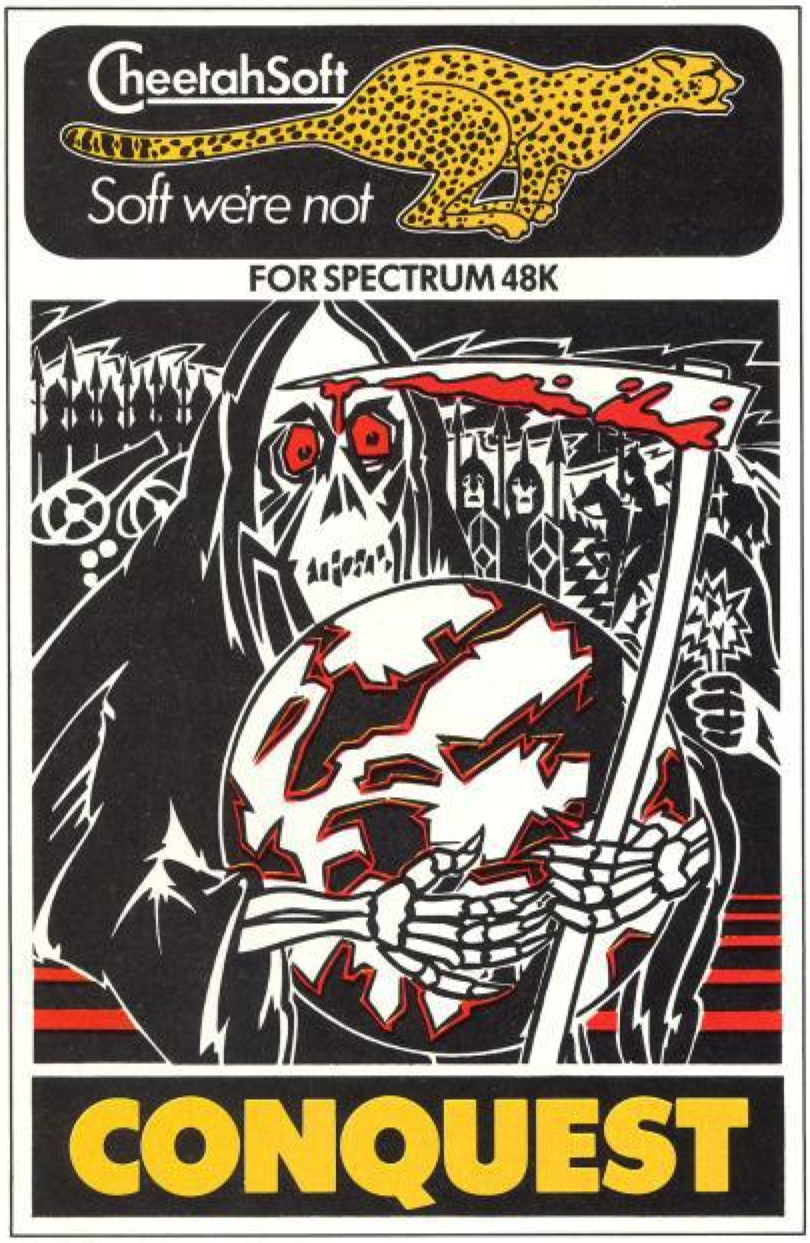
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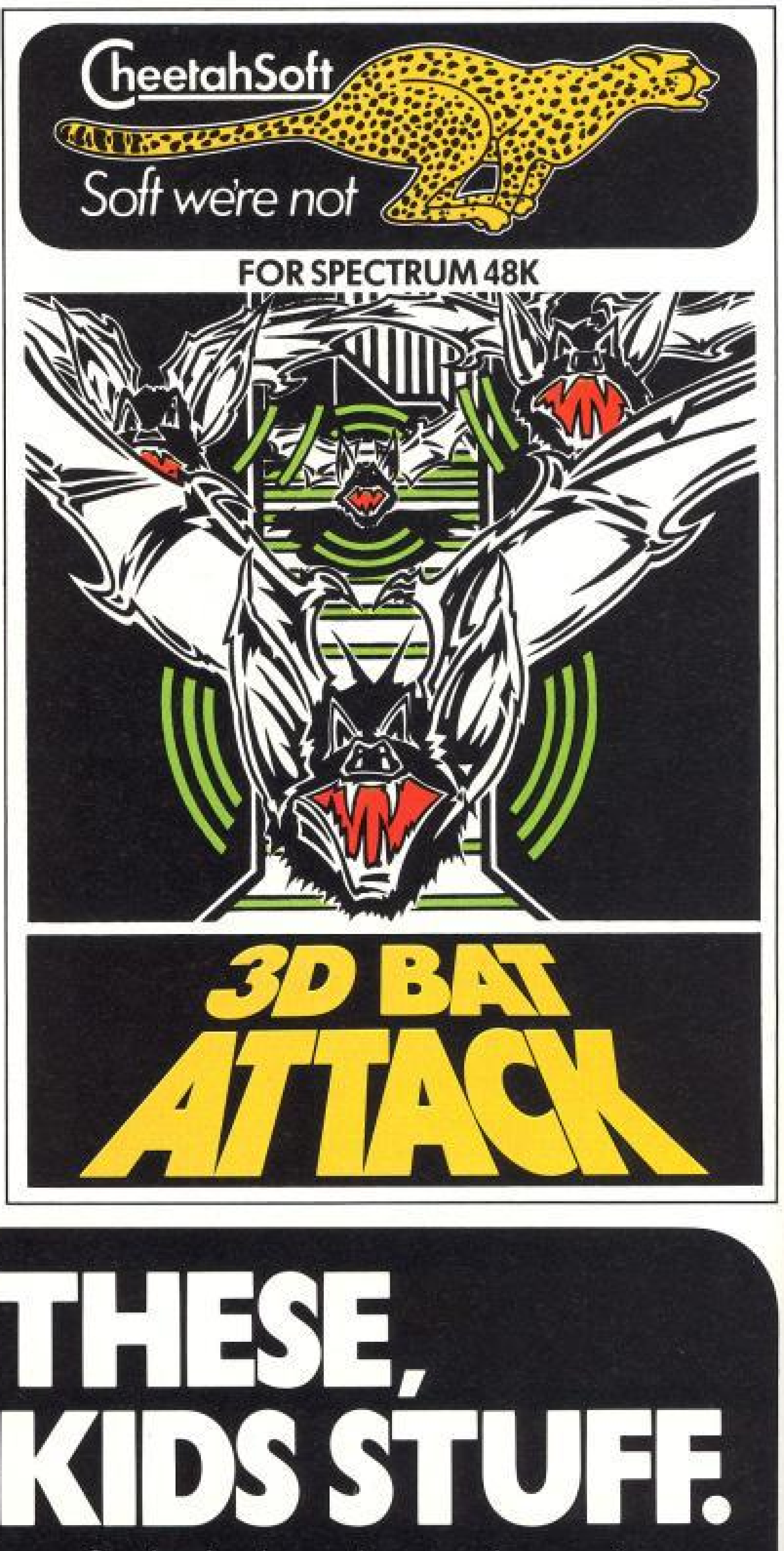

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CheetahSoft

Soft we're not

A Big Hi to the Wonder Chip

The mighty Motorola 68000 series of multi-bit MPUs has been selected for the QL (by Sinclair) and the MacIntosh/Lisa (by Apple). It's said to be capable of anything except giving change.

We asked BERNARD TURNER to give this chip the Big Suss.

He likes it.

IF SILICON chips could choose their Microprocessor Unit (MPU) they would probably vote for the Motorola MC68000 — as has Sir Clive Sinclair. *And* Steve Jobs. *And* his people at Apple in their latest machines (Sinclair's QL has the 68008, a member of the general 68000 family).

Why is there all this sudden interest in the 68000?

Firstly it is not a *sudden* interest. The 68000 has been around for some time; it is only now that machines are leaving the drawing boards to reach the adverts (I haven't got my QL yet!) which means that it is only a short time (Real Time, not Sinclair Time) before I can get my grubby big hands on those beautiful 'double' eight registers and accelerate into the corners of possibilities now made available by the MC68000's flexible addressing modes.

You may realise by now that this writer thinks a lot of the 68000. You're dead right — but I also realise that it is not the MPU to end all MPU's

At this point a brief survey of the wonder chip is in order.

The 68000 is a MPU that contains the following registers:-

8 Data Registers (all 32 bits wide) Named D0 to D7

9 Address Registers (all 32 bits wide) Named A0 to A7

1 Program Counter (PC) (32 bits wide)

1 Processor Status Word (PSW, 16 Bits wide).

You may be wondering what happened to the stack pointer — don't worry, it's Address register 7 (A7). The 68000 has in fact TWO stack pointers; one of them is called the Supervisor Stack Pointer (SSP); the other one is the User Stack Pointer (USP). 'Very nice' (you say), 'but why two?

Deviates

You'll very often find that all machines that can be truly called Computers run two programs at the same time. One of them is normally 'your' program; the other is the Operating System.It is therefore a good idea to keep these programs' stacks separate to minimise error possibilities.

In the 68000 the two stack pointers (USP and SSP) *are* separate. Both can be accessed when in the Supervisor Mode — but only the USP can be accessed in the User Mode. The Supervisor Mode is signified by the 'S' bit being set in the PSW. (In User Mode the 'S' bit is clear). The difference is that in Supervisor Mode you are allowed to execute all of the 68000's instructions; whereas in User Mode there are a few instructions that are privileged (mainly those that are possible means of entering Supervisor Mode!). So the only method of entry into Supervisor Mode is through what are known as 'Exceptions'.

Computers

Exceptions, in the case of the 68000, are those occasions when the processor deviates from its normal processing, e.g. interrupts, Errors (hardware and software such as bus errors or a divide-by-zero.).

Don't ever try to divide-by-zero.

The 68000 allocates the first kilobyte of memory to 'Exception Vectors', i.e. memory locations that contain pointers to addresses that are themselves the start of routines to handle the Exceptions that have occurred. (Still with me?) This allows you to program your main problem without having to worry too much about problems such as butter overflow and addresses wildly out of range.

The 68000's instruction set is probably the best this writer has seen in any micro. The object codes (what the micro actually runs on) have been well exceptionally thought out in terms of compactness. Versatility and ease of use are other virtues. Coming from the 6502 side I can appreciate its simple yet convenient and powerful approach to this business of mode addressing, allowing complex data structures to be implemented. From its Program Counter Relative Addressing Mode it is dead easy to construct code that is relocatable (a boon that many 8-bitters would fancy) so that they could load and execute programs anywhere in memory that they wanted, possibly having two or more programs simultaneously resident in memory ready to run.

Attention

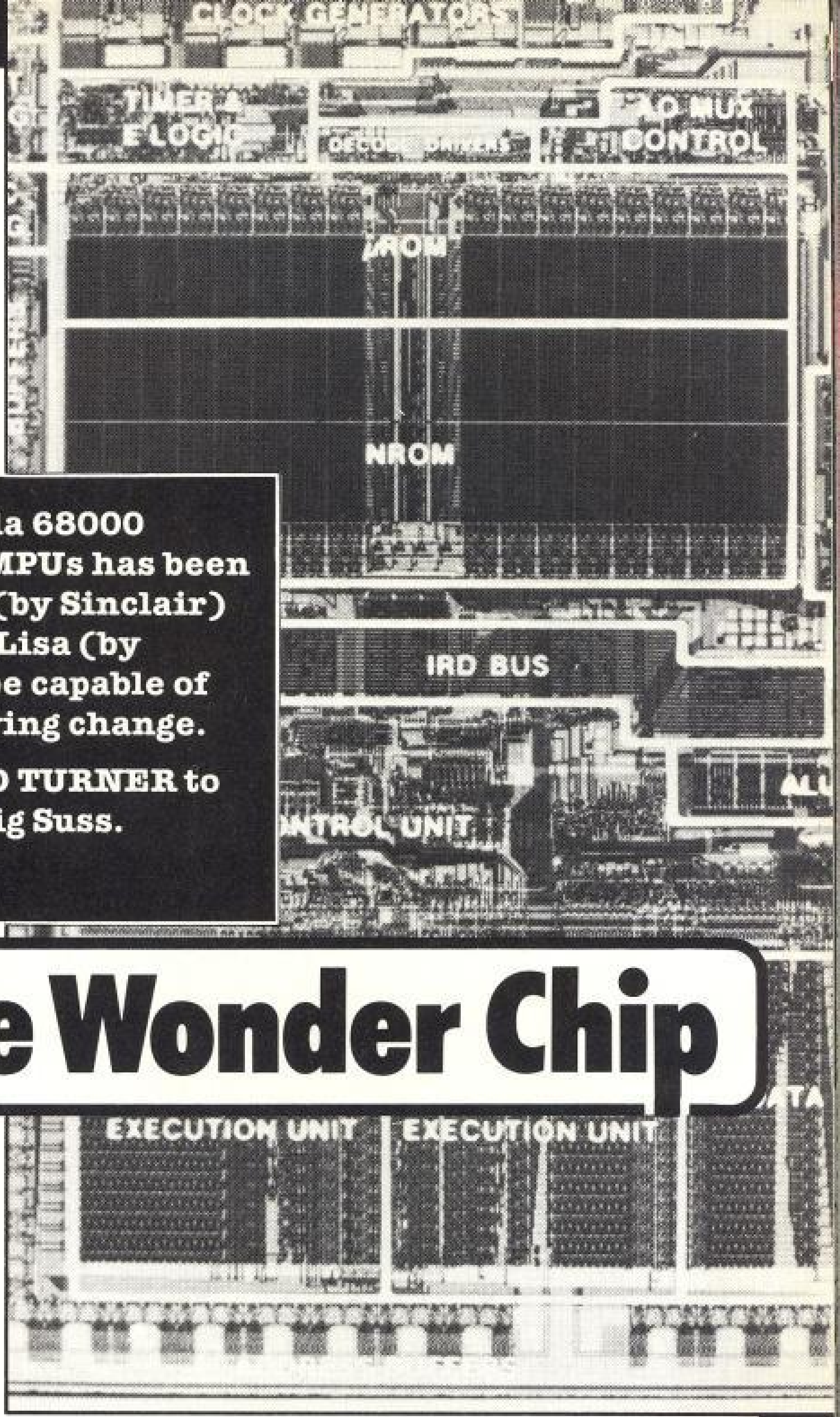
Talking of memory . . . the 68000's address range is 16 Megabytes, which is 8 MegaWords (a word equalling 2 bytes). This range could be increased by future microComputer designers (NOT MicroProcessor Designer) if he designs his Micro with attention to the processor's state as indicated by the Function control pins (FC0-2). The 68008 has only a 1 Megabyte range — its main difference from the 68000 (apart from being physically smaller and having an 8-bit data bus as opposed to the 68000's 16-bit bus).

Still with me?

Sure you are.

Many people these days are arguing about whether one particular 68-thou MPU is 8-16- or 32-bits. For my money the 68008 is a true 16-bit processor mainly because of its linear address range (similar to an 8-bits 64k range).

In future articles I will be tackling the 68000 from a programmer's point of view.

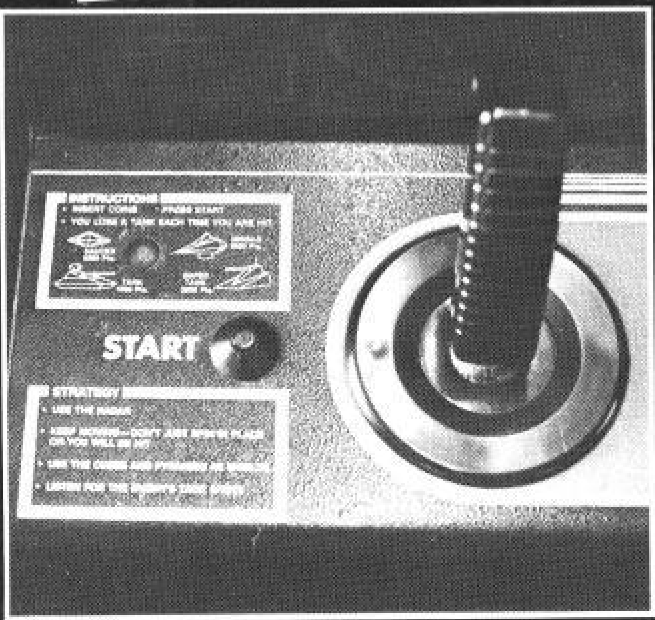


This is It. The Motorola 68000 chip. Blown up big.

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WIN A REAL GN
FULL-SIZE AR

. . . be the envy of your friends if you win this brill, free-to-enter Big Kompetition!



We've got a real, free-standing, BATTLEZONE video game unit that we're just itchin' to give away. Every home should have one — but only one lucky Big K reader will get their hands on this particular unit. All you have to do is enter this great competition.

WHAT YOU GET

A full-size BATTLEZONE video game, straight from the arcades. Not a new machine but fully reconditioned and in first class working order. Authentic even down to the coin slots. But don't worry — the unit is set for unlimited free play.

A FANTASTIC GAME

BATTLEZONE is one of the classic arcade games. Superb 3D graphics in sharp, vector-scan resolution make it instantly identifiable. You control a tank in a futuristic tank battle. Look out through the driver's slit, steering your way through the pyramids using the twin joysticks and blasting enemy tanks to notch up your score. But watch out, they shoot back! Your radar warns you of their approach.

ENTRY TOKEN
Only entries bearing this entry token will be eligible for the BIG K BATTLEZONE competition. You have been warned pals!

HOW TO ENTER

Look at the grid printed here. In our prize arcade game the player sees the terrain through the driver's slit but for this competition you have a bird's-eye view of the battle zone. The shaded areas are buildings and you are in charge of the tank outside the grid.
Your mission is to enter the grid from the bottom right-hand corner, Destroy all the enemy tanks in the town and then exit from the top right-hand corner. You must not go on any shaded square nor must you cross any square twice. To ensure destruction of an enemy tank you must overrun its position. Each tank has an identification letter and, as you move round the town you should note down the letter of each tank as you destroy it.
Next, take a postcard (or you can use the back of a sealed down empty envelope) and put on it the nine identification letter *in the order in which you destroy them.* As a tie-breaker tell us in not more than 20 words what your favourite arcade game is and why. Firmly affix the special entry token to your postcard/envelope and don't forget to write your name, age and address. Finally, post your completed entry to BIG K TANK COMPETITION, 55 EWER STREET, LONDON SE99 6YP to arrive no later than Friday 29th June, 1984, the closing date.

COMPETITION • COMPETITION • COMPETITION • COMPETITION • COMPETITION • COMPETITION • COMPETITION

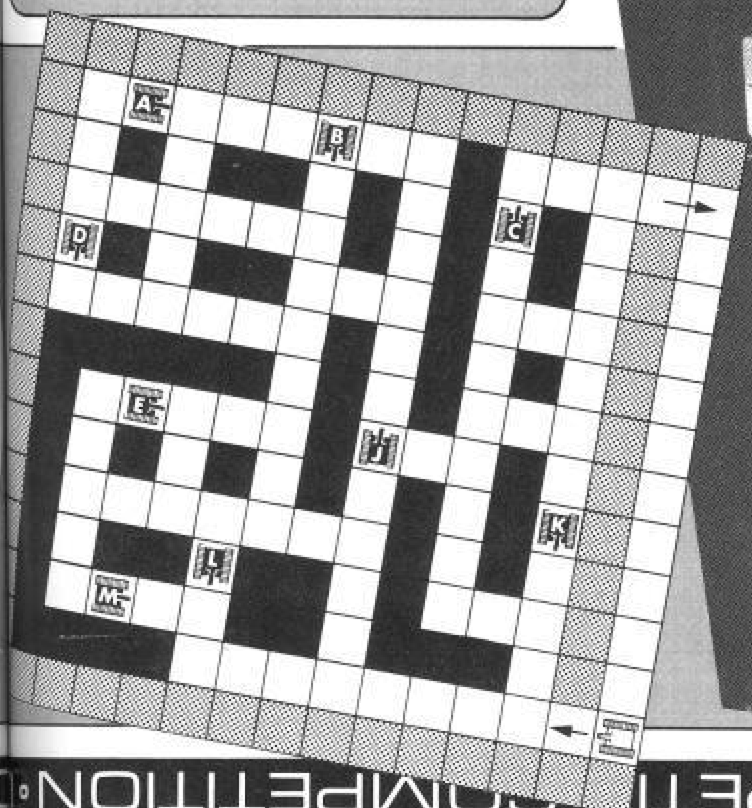
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GENUINE, NO FOOLIN', RCADE VIDEO GAME!

There is no entry fee but each entry must be on a postcard or back of a sealed down empty envelope and must bear the entrant's own name, age and address and a special entry token cut from this page.
All entries received by the closing date will be examined and the prize awarded to the sender of the correct entry submitting the most apt, original and best-expressed tie-breaker, with age being considered. The prize must be accepted as offered; there can be no alternative awards, cash or otherwise. If the winner is aged under 18 years then parental consent must be obtained before the prize can be awarded.
This competition is open to all readers in England, Scotland and Wales other than employees (and their families) of IPC Magazines Ltd., and the printers of Big K.
Any entry received after the closing will be disqualified as will those received incomplete, mutilated, illegible or not complying with the rules and instructions exactly. The judges' decision is final and legally binding and no correspondence will be entered into.
The winner will be notified and the result published later in BIG K.

RULES





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ZIP CODE

The American angle from Big K's Stateside man, MIKE GOLD

WHERE HAVE ALL THE POWERS GONE?



No 5200s please, we're British! Atari's 5200 'super VCS' system remains a rare, U.S.-only product. Will it ever leave home?

It should come as no great revelation that America is an unusual place. We keep coming up with all this really neat stuff — televisions, video games, VCRs, computers — and then we do everything in our considerable power to muck it all up.

Just a couple of years ago, the video game field was going like gangbusters. There were at least four different systems — Atari, Mattel, Bally and Magnavox (Phillips) — and all of them had a shot at the brass ring.

Today, Bally and Magnavox are out of the field, and Mattel has sold off its electronics division. Its long-range success potential has been politely described as "remote".

Today, there is still a variety of formats — Atari has three — and newcomer Coleco Industries blew most of its competition out of the box with its Colecovision. But both Atari and Coleco spent the bulk of 1983 throttling the geese that laid their golden eggs. Coleco directed its attention to its compatible home computer named "Adam", and Atari developed an endless array of new computers while flooding the shops with games for its original VCS system (renamed the 2600).

What Atari failed to recognise was that they were their own worst enemy. While people were chosing between the 2600, Mattel's Intellivision, and the Colecovision, Atari came out with a souped-up VCS named the 5200. With a clumsy joystick and a limited selection of games, initial reception to the 5200 was, at first, quite cool.

Atari also was faced with a ton of software competition. By the spring of last year, there were at least fifteen different companies making games for the VCS. Even Mattel and Coleco were making watered-down versions of their popular carts. But Atari continued to flood the stores as if they had it all to themselves. They spent a fortune on licensed games — E.T., Raiders of the Lost Ark — and on heavily promoted original games like the Swordquest tetraology. Only Atari was surprised when they bombed.

The trouble with Coleco's Adam was, it wasn't worth the wait. Billed as a powerful home computer with built-in word processing and a printer for $600.00 ($450.00 if you already owned a Colecovision), what consumers got was a home computer with almost no software and a truly rotten printer — very, very slow, very, very noisy. The free game cart — Buck Rogers' Planet of Zoom — paled before the company's own Colecovision carts.

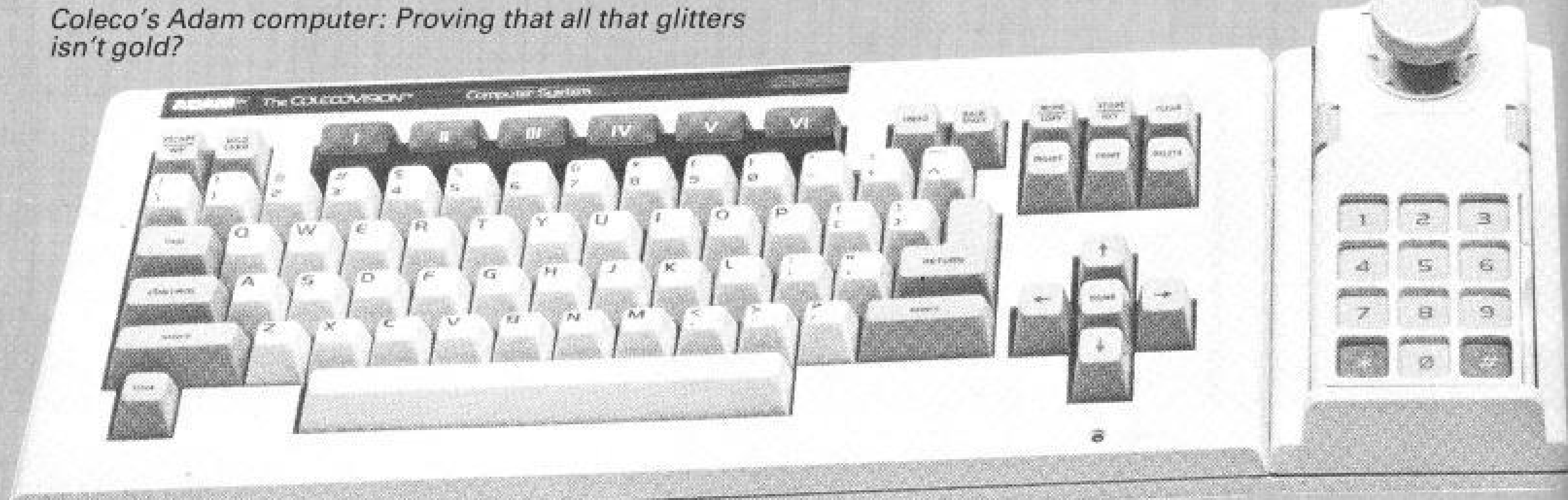
The Adam came out months late, in very short supply, at a much higher price. All the while, the company gave very little attention to their original game system, releasing few carts and even fewer good games.

But all is not lost in the world of home video games. Many gamers have "graduated" to personal computers where compatibility is secondary to function. And while this field, too, has seen some prominent casualties — Texas Instruments, Timex/Sinclair, and the Mattel Aquarius to name but three — there is clearly a bright future ahead. A future dominated by some real heavy hitters: IBM, Apple, Radio Shack, maybe Commodore, and, possibly Atari.

Particularly Atari. Whereas Wall Street wouldn't be the least bit surprised to see parent-company Warner Communications sell off or even close down this money-losing operation, Atari just might have the best chance at succeeding in this end of the market.

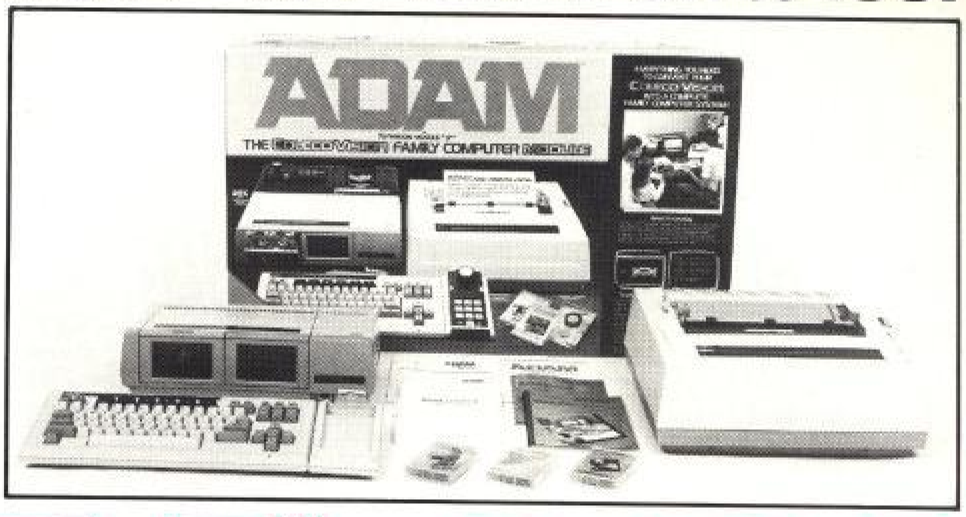
How is this possible? We'll tell you next month.

Coleco's Adam computer: Proving that all that glitters isn't gold?



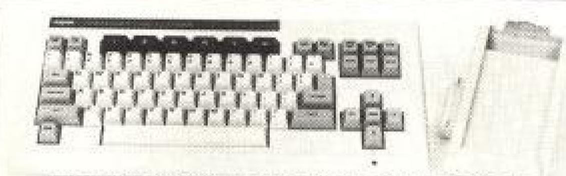
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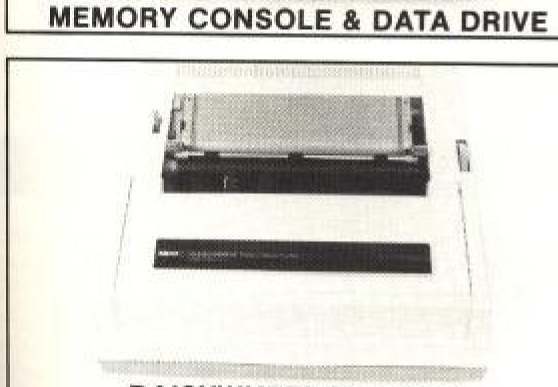
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If you're looking for real value in a computer system, one which can handle anything from serious Word Processing to enhanced Colecovision style video games such as Buck Rogers, look no further. The Coleco Adam is here with a package which will make you wonder if you're dreaming when we tell you about it. A price breakthrough in computer systems, Adam is comprised of an 80K RAM memory console with a built-in 256K digital data drive; a professional quality, stepped and sculptured 75 key full-stroke keyboard; a letter quality daisywheel printer and a full word processing program built into the Console. Two additional pieces of software, Smart BASIC and also 'Buck Rogers - Planet of Zoom' (the ultimate in advanced video games), are included as well as a blank digital data pack. Adam can be used with any domestic colour Television set.*

MEMORY CONSOLE/DATA DRIVE: *The heart of the Adam system is the 40K ROM and 64K RAM memory console which combines with the 32K ROM and 16K RAM in Colecovision to give you a total of 72K ROM (including 24K cartridge ROM) and 80K RAM (expandable to 144K). Built into the memory console is a digital data drive which accepts Adam's digital data packs, a fast and reliable mass storage medium that is capable of storing 256K of information, that's about 250 pages of double spaced text! The console is also designed to accomodate a second optional digital data drive.

FULL STROKE KEYBOARD: The Adam keyboard has been designed as a professional quality keyboard that combines ease of use with an impressive array of features. It is stepped and sculptured for maximum efficiency and has 75 full stroke keys which include 6 colour coded Smart Keys which are redefined for each new application; 10 command keys which are dedicated to the word processing function, and 5 cursor control keys for easy positioning of the cursor at any point on the screen. You can attach a Colecovision controller to the keyboard to function as a numeric keypad for easy data entry. It can also be held like a calculator, a feature which makes working with numbers particularly easy. The joystick part of the hand controller can be used in the same way as the cursor control keys, to move the cursor around the screen.

LETTER QUALITY PRINTER: The SmartWriter letter quality daisywheel printer is a bi-directional 80 column printer which prints at a rate of 120 words per minute. It uses standard interchangeable daisywheels, so a variety of typestyles are available. The printer has a 9.5 inch wide carriage for either single sheets or continuous fan fold paper and uses standard carbon ribbons. It is comparable to many printers which cost as much as the total Adam package. The printer can be used either with the Adam's SmartWriter word processing program or as a stand alone electronic typewriter.

BUILT-IN WORD PROCESSOR: Adam comes with SmartWriter word processing built-in. This program is so easy to use that you only have to turn the power on and the word processor is on line and ready to go. Detailed instruction books are not necessary as the Computer guides you step by step, working from a series of Menu commands. It enables you to type in text, then completely edit or revise it with the touch of a few keys. Changes are readily made and a series of queries from the computer confirm your intentions, so that you can continuously double check your work as you type.

COMPATIBILITY WITH COLECOVISION: By using high speed interactive microprocessors in each of the modules, the Coleco Adam is designed to take additional advantage of both the 32K ROM and 16K RAM memory capability in the Colecovision. If you do not already own a Colecovision Console (£99 inc VAT), then you will need to purchase this when you initially purchase your Adam Computer package (£499 inc VAT), making a total purchase price of (£598 inc VAT).

WHAT IS COLECOVISION: Colecovision is one of the worlds most powerful video game systems, capable of displaying arcade quality colour graphics of incredible quality on a standard Colour TV set. The console (see picture bottom left) accepts 24K ROM cartridges such as Turbo and Zaxxon and is supplied with the popular Donkey Kong cartridge and a pair of joystick controllers. Colecovision has a range of licenced arcade hits available such as: Gorf, Carnival, Cosmic Avenger, Mouse Trap, Ladybug, Venture, Smurf, Pepper II, Space Panic, Looping, Space Fury, Mr Do, Time Pilot, Wizard of Wor and many others. So there you have it, Adam plus Colecovision the unbeatable combination. Send the coupon below for your FREE copy of our 12 page Colour brochure giving details on the complete Adam system.

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Address: ....

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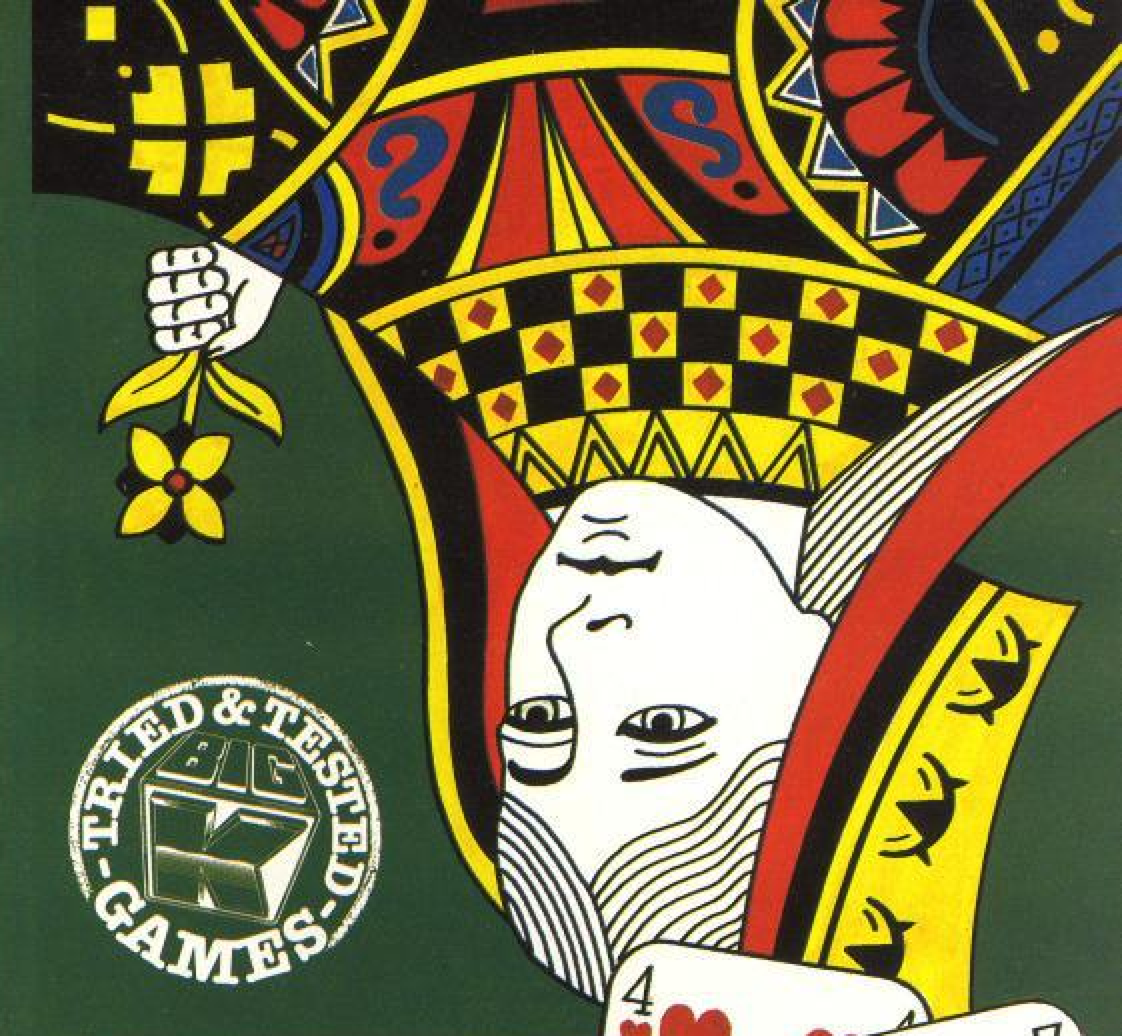


```
  10TEXT:E$=""+CHR$(27):PAPER7:DIMN(52)
,PC(102):GOSUB9000:YW=10000:MW=10000
  20 PAPER2:INK0
  30 IF S=1 THEN GOSUB 9400:S=0:C=0
  40PRINTFRE(""):HIRES:PAPER2:CC=0:BET=
0:TB=0: TB$="": E$=" "+CHR$(27)
  50 IF MW<=0 THEN 10050
  60 EE$="You are": INK0: POKE 618.2:IF
 YW<=0 THEN 10050
  70 H=12:V=10:W$="Bank    ":GOSUB 4120:
 H=126:W$="Total bet    ":GOSUB 4120
  80 H=28:V=190: W$="Total=": GOSUB4120
: H=126:W$="Total bet    ":GOSUB 4120
  90 GOSUB 3440: CH=42:BK=1: GOSUB 6000
 100 X=15:Y=110:GOSUB 3000: GOSUB 1000
 110 X=X+42:GOSUB 3000
 120 IF T>21 THEN CLS: PRINT E$"L"E$"A
     ":EE$:" bust!!":GOSUB 1200: GOTO 13
0
 130 IF CC=5 AND YT=0 THEN 2000
 140 IF CC=5 THEN T=21
 150 IF YT>0 THEN GOTO 180
 160 POKE618.3: GOSUB 1000:IF X$="N" TH
EN 2000
 170 POKE 618.2: GOTO 110
 180 IFT>17ORTA>17ORCC=5 THEN GOTO 200
 190 GOTO 110
 200 IFTA>T THEN T=TA
 210 CLS: GOSUB 12000: GOTO 30
1000 IF CC-1 THEN GOTO 1040
1010 CLS: PRINT "Do you want to select
another card?";
1020 GET X$: IFX$="N" THEN POKE 618.2:
RETURN
1030 IFX$<>"Y" THEN 1020
1040 PRINT:INPUT  "Input bet value or T
 for twist": BT$:IFBT="T"THEN RETURN
1050 BET = VAL (BT$): IF BET>YW THEN CL
S:THEN PRINT "You only have  "YW" left".
:GOTO 1040
1060 IF BET<0 THEN PRINT "No minus quan
tities allowed." "CHR$(11):GOTO 1040
1070 YW=YW-BET:TB=TB+BET:TB$=STR$(TB) :
 POKE 618.2:RETURN
1200 IFTC=1 AND CC<>5 THEN YT=TZZ+1
1210 IF (YT<T) OR T>21 AND YT>0) THEN P
RINT "You won't": YW=YW+TB+TB:MW=MW-TB:G
OTO 1230
1220 PRINT "I won.":MW=MW+TB
1230 IFT=21 AND A>0 AND CC=2 THEN S=1
1240 T=0: YT=0: TA=0: TA$=:CT=0
1250 GOSUB 3440
1260 PRINT "Do you want another hand?";
: POKE 618.3
1270 GETX$:IFX$="N" THEN 10100
1280 IFX$<>"Y" THEN 1270
1290 POKE 618.2: RETURN
2000 CLS:PRINT "I will select my hand."
: POKE 618.2:IFCC=5 THEN CT=1
2010 IFTA>T THEN T=TA
2020 YT=T:IFT=21 AND TA>0 AND CC=2 THEN
 S=1
2030 T=0:TA=0:CH=127:BK=0:EE$= "I am":
CC=0:TA$=""
2040 GOSUB 6000
2050 X=15: Y=20: GOSUB 3000: GOSUB 4000
2060 GOTO 110
3000 REM****GENERATE CARD VALUE****
3010 C=C+1:CC=CC+1:IFC=53 THEN C=1
3020 SU=INT((N(C)-1)/13)+1:IFSU<3 THEN
CO=0ELSECO=1
3030 N=N(C)-(13*(SU-1)):NN=N+48:SU=SU+9
0
3040 IFNN=49 THEN NN=65
3050 IFN=58 THEN NN=76:N=0
3060 IFNN=59 THEN NN=74:N=10
3070 IFNN=60 THEN NN=81:N=10
3080 IFNN=61 THEN NN=75:N=10
```

```
3130 T=T+N:T$=STR$(T):IFNN=65 OR T<0 TH
EN TA=T+10:IFTA>21 THEN TA=0:TA$= "
"
3140IF TA>0 THEN TA$=STR$(TA):TA$=" or
"+RIGHT$(TA$,LEN(TA$)-1)
3200REM**** GENERATE CARD ****
3210CURSETX.Y,3:FILL70.1.23:CURSETX+30,
Y.3:FILL70.1,18
3220CURSETX+3,Y+3.3:CHAR NN,0.1:CURSET
X+19,Y+64.3:CHAR SU,0,1
3240CURSETX 5,Y.3:FILL70.1,0
3300REM**** SELECT CARD DISPLAY ****
3310IF (N>65)AND(NN>82)THENGOSUB4200:GO
TO3400
3320IF N/2<>INT(N/2)THENXX=10:YY=35:GOS
UB4000
3330IFN=2 ORN=3 ORN=8 OR N=9THENXX=10:Y
Y=22:GOSUB4000:YY=48:GOSUB4000
3340IFN>5THENXX=3:YY=35:GOSUB4000:XX=18
:GOSUB4000
3350IFN>3THENXX=3:YY=22:GOSUB4000:YY=48
:GOSUB4000
3360IFN>3THENXX=18:GOSUB4000:YY=22:GOSU
B4000
3370IFN=10THENXX=10:YY=12:GOSUB4000:YY=
25:GOSUB4000:YY=38:GOSUB4000
3380IFN=10THENYY=51:GOSUB4000
3400H=70:V=Y+80:W$=T$+TA$:GOSUB4100
3410IFTB$=""ORYT>0THEN3430
3420H=197:W$=TB$:GOSUB4100
3430IFYT>0THENRETURN
3440H=48:V=10:W$=STR$(MW):GOSUB4110
```

You're in Las Vegas. The lights are bright, the casinos inviting. A dark, seductive female asks you, "Blackjack, sir? Pontoon? 21?" You nod, awaiting the cards to be dealt. Instead you're handed an Oric-1. "There you go, sir. The program's listed below. Have a good day!"

for ORIC-1 and Atmos



```
3450H=190:W$=STR$(YW):GOSUB4100
3460RETURN
3999REM**** DISPLAY CHARACTERS ****
4000W$=RIGHT$(W$,LEN(W$)-1)
4120CURSET H,V,3:FORI=1TOLEN(W$):CHAR12
7,0,0:CHARASC(MID$(W$,I,1)),0,1
4130CURMOV6,0,3:NEXTI:CHAR127,0,0:RETURN
4200CURSETX+10,Y+14,3
4210FORI=1TO62SETP2:DRAWPC(I),PC(I+1),1
:NEXT
4220FORI=63TO102STEP2:CURSETX+PC(I),Y+P
C(I+1),1:NEXT
4230RETURN
6000REM **** GENERATE BANKERS CARD ****
6010X=15:Y=20:FB=20
6020CURSETX,Y,3:FILL70,1,FB:CURSETX+30,
Y,3:FILL70,1,18
6030FORI=X+3TOX+15 STEP6:FORJ=Y+6TOY+54
STEP6
6040CURSETI,J,3:CHARCH,0,BK
6050NEXTJ:NEXTI
6060X=X+42:IFX=99THENRETURN
6070GOTO6020
9000PRINTCHR$(12):PRINTCHR$(4)E$"N"E$"A
    **** PONTOOON ****"CHR$(4):INK4
9010POKE618,2:PRINT:PRINT:PRINT" This p
rogram simulates the card"
9020PRINT"game of PONTOON.":PRINT:PRINT
"  the computer will ask you to ";
9030PRINT"first select the amount of mo
ney you wish to bet on the ";
9040PRINT"first card, followed by a cho
ice of - "CHR$(10)"a) betting mo";
9050PRINT"re money          or b) "E$"ET"
E$CHR$(8)"Dwisting"
9060PRINT"on subsequent cards.":PRINT:P
RINT" The program will allow for";
9070PRINT"access    high or low, and fi
ve card tricks."
```

```
9080PRINT:PRINT"When responding to a qu
estion with a Yes or No, it is";
9090PRINT"only necessary to press Y or
N.   All other keyboard"
9100PRINT"inputs must be followed by on
e press of the RETURN key."
9110PRINT:PRINTE$"A Press X for further
 explanation"
9120PRINTE$"A    or Space Bar to start
game.":GOTO9300
9130PRINTCHR$(12):PRINTCHR$(4)E$"N"E$"A
    ****PONTOON****"CHR$(4):INK4
9140PRINT:PRINT:PRINT" The object of th
e game is to beat the bank by ";
9150PRINT"achieving a higher score, up
to a maximum of 21 in each hand."
9160PRINT:PRINT"You each start with a k
itty of    '10,000. The";
9170PRINT" the computer is the Bank, an
d it does not 'see' your hand until"
9180PRINT"his total is as close as 21 a
s he can get, without going"E$;
9190PRINT"Abust!":PRINT:PRINT"    If a p
ontoon is dealt, ie a picture card";
9200PRINT"or a ten with an ace, then th
e  pack will be reshuffled at ";
9210PRINT"the end   of the hand, the di
splay will give two"
9220PRINT:PRINT"With an ace in the hand
, the display will give two";
9230PRINT"alternative rersults if the t
otals are below 22.  You may elect";
```

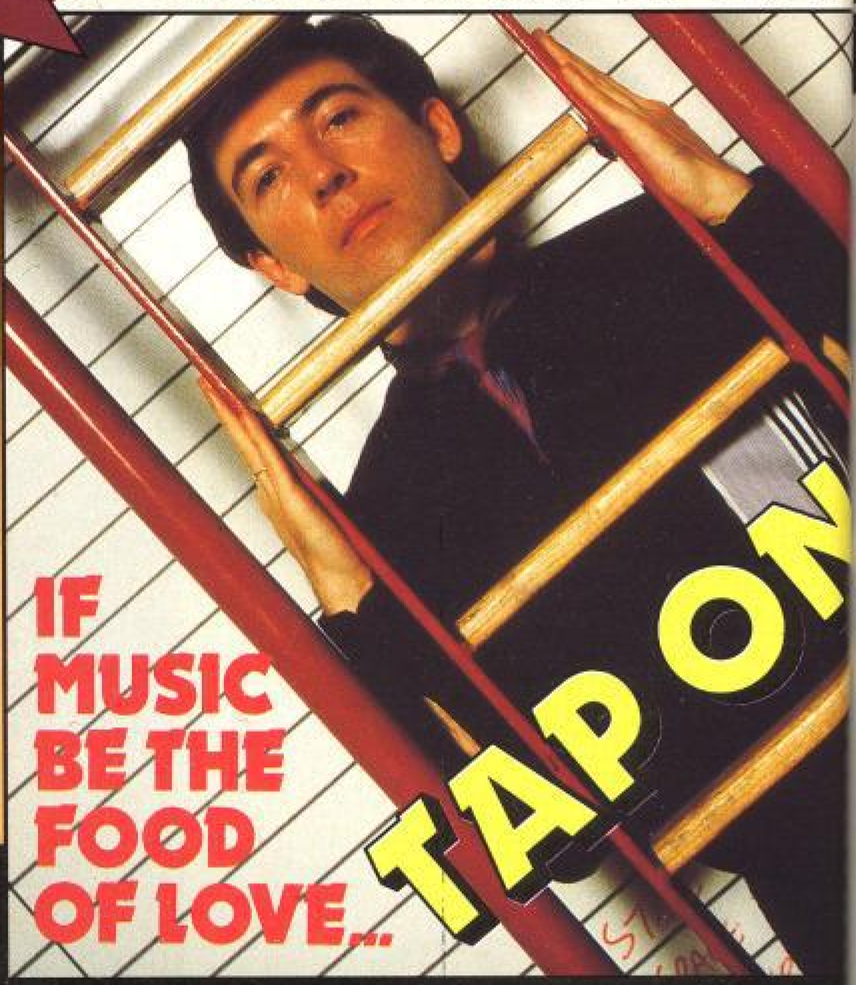
```
9240PRINT"To draw another card if not t
he     higher of the two scores";
9250PRINT"is recorded.":PRINT
9260PRINTE$"APress Space Bar to start t
he game":GOTO10000
9300REM **** CREATE CHARACTERS ****
9310P=91
9320FORI=0TO7:READDA:POKE46080+(P*8)+1,
DA:NEXT
9330READP:IFP=0THEN9500
9340GOTO9320
9350DATA4,14,31,21,4,0,0,0,92
9360DATA4,14,31,31,10,4,4,0,93
9370DATA27,27,31,14,4,0,0,0,94
9380DATA4,14,31,14,4,0,0,0,76
9390DATA0,38,41,41,41,41,38,0,0
9400REM ****SHUFFLE****
9410TEXT:CLS:POKE616,10:PRINT:PRINT"
The cards must be reshuffled."
9420PRINTSPC(10)"please wait."
9430FORI=1TO52:N(I)=I:NEXT
9440FORI=1TO52:D=INT(RND(1)*52)+1:DD=N(
I)
9450N(I)=N(D):N(D)=DD:NEXT:C=0
9460RETURN
9500FORI=1TO102:READPC(I):NEXT:GOTO1000
0
9510DATA1,1,1,-1,1,1,1,-1,1,1,1,1,-1
9520DATA2,-6,0,0,-2,0,10,6,0
9530DATA0,-8,0,8,5,10,-16,0,5,-10
9540DATA-5,10,5,10,6,0,5,-10,-5,10
9550DATA0,10,-1,-1,-1,1,-1,-1,-1,1
9560DATA-1,-1,-1,1,0,-12,0,9,6,0
9570DATA11,19,14,19,12,20,11,22,12,22,1
3,22,14,22
9580DATA12,27,12,29,12,31
9590DATA13,37,13,39,13,41,12,46,13,46,1
4,46,15,46
9600DATA14,48,12,49,15,59
```

```
10000GETX$:IFX$=" "THENGOSUB9400
10010IFX$<>"X"THEN10000
10020GOTO9130
10050TEXT:POKE616,10:PRINT:PRINT"
"EE$" SKINT!!"
10060PRINT:PRINT"  Please RE-RUN the pro
gram if you"
10070PRINT"want another game."
10100TEXT:END
>
```



Each month BIG K collars an expert in a particular field to review a selection of progs which claim to reproduce his line of work. This month: PETE SHELLEY

Reporter: RICHARD COOK



AS VOCALIST, guitarist and leader of Buzzcocks, Pete Shelley put a little romance into the attack of the New Wave which shook rock music in the mid-70s. His love songs channelled the power of punk into a form which laid groundwork for much of today's pop: beguiling music that was as fresh and energetic as any of the system-smashing ambitions of his contemporaries in The Jam and The Clash.

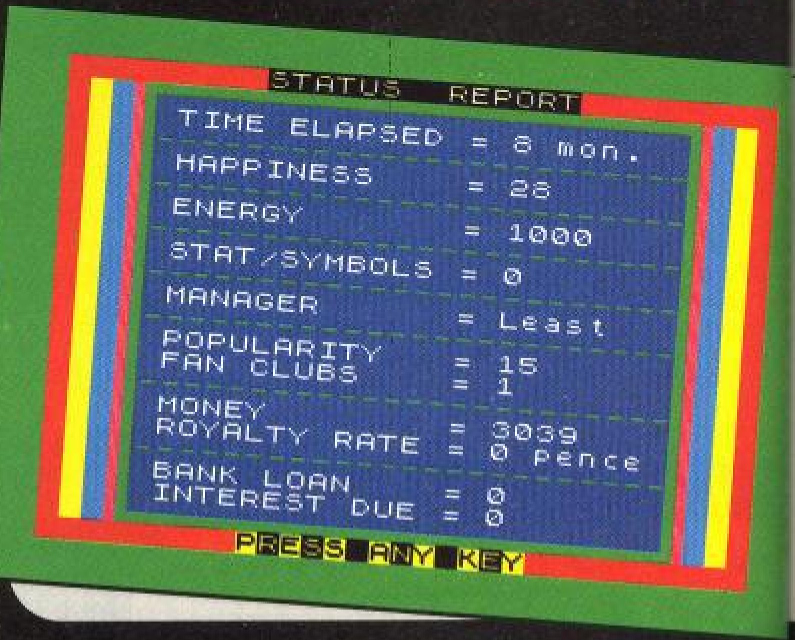
After the demise of Buzzcocks back in 1981, Pete embarked on a solo career which has taken quite a different track. His starry-eyed songs are now set to music made primarily through synthesisers and sequences that show one of the most imaginative approaches to instruments otherwise commonplace in today's charts.

And alongside this interest in new sounds Pete — along with a few others we know — developed a fascination with computers: the last track on his most recent LP was a program for Spectrum!

Pete started with a ZX81. Now he has two Spectrums, a Commodore 64 and a BBC 'B' as well. Although he's hard at work in the studios recording his third LP for Island Records, *Big K* asked him to take some time off to check out a handful of programs designed to help write, practice or maybe just fool around with music. Can a micro assist you in making fortune and infamy in the pop world? We set up the machines; Pete flexed his fingers; and here are the verdicts.



> Putting notes in in real time is good — but then, you can't hear them simultaneously, which isn't so good

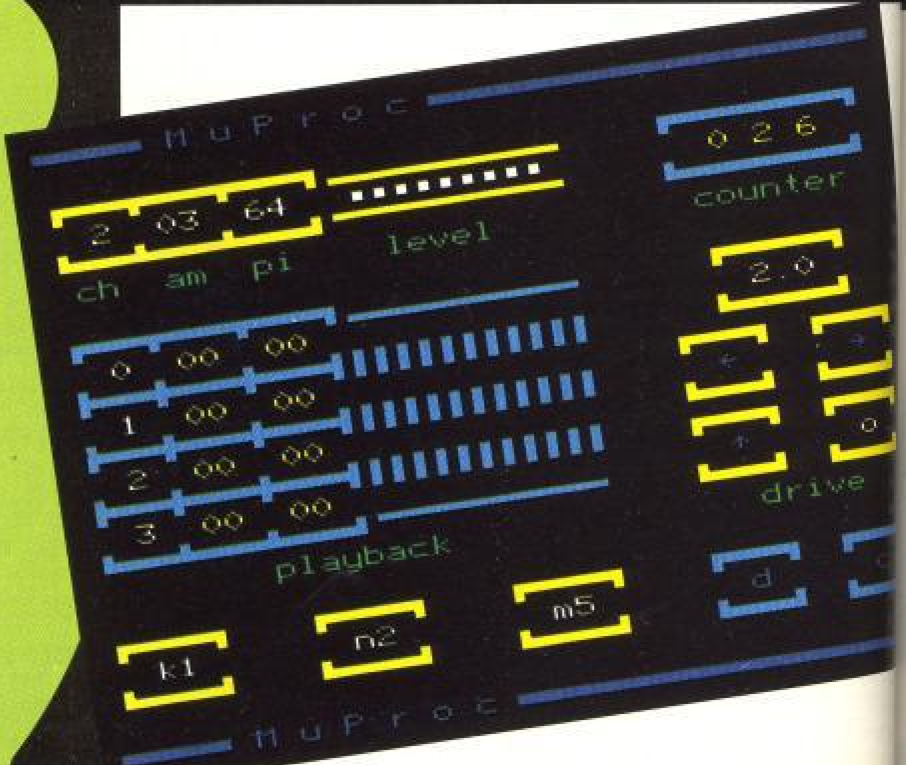


A rather complex program for writing music: it acts as a four-channel sequencer, can define up to 16 instruments and save and play pieces. It's menu-based, with a detailed editing function that permits notes to have different attack levels, durations and tonal qualities. A piece can be played right through or broken down into a verse structure. The display consists of a numerical layout that details the various facets of the music at it's being composed. There is an additional 'Auto-Composer' programme that generates tunes automatically with a minimum of user guidance.

"Well, I've been on it half an hour and not written a note yet! There seems to be lots of numbers on the screen, lists and lists . . . it doesn't look much like music. There's no stave anywhere, and it's pointless having a graphic capability if you're never going to do anything with it. The BBC has good sound channels which are difficult to program and something like this should make it a lot easier. The instructions are concise — in fact they read like a program themselves, you can't skip through them. It's good that you can put the notes in without playing them in real time but then you can't *hear* them as you're putting them in. It gets to be like a counting exercise, and tracing back faults at the end would take time.

"I think you'd have to know a bit about computers — typing in numbers — and a bit about music as well to get much out of it. I'd say on balance it's the best so far for someone who wanted a semi-professional aid to writing music."

Prog: BBC MUSIC SYNTHESISER
Maker: BUG-BYTE
Machine: BBC MODEL B
Format: cassette
Price: £9.50





Prog: ULTISYNTH
Maker: QUICKSILVA
Machine: COMMODORE 64
Format: cassette
Price: £14.95

S.I.D. Sound

A music-writing program which has features very similar to those detailed above, all neatly laid out in a very long and rather confusing manual. With effects like ring-modulation incorporated it seems designed to show off the capabilities of the micro's Sound Interface Device chip more than anything, and again there is no stave in the display — tunes are shown in graph forms.

"In the book it says it does a lot, and there are some interesting rhythms — one facility of the program lets you use the computer like a rhythm box. But it's very hard to get it all to work for you and it doesn't seem too useful as a tool. It doesn't do anything which I can't get but want from the other programs.

"It's difficult to write sound on computers, and in a way these are all filling in something that should be present on the computer anyway. Probably the ideal thing would be to have a program that converts the keyboard into a 'proper' keyboard, playing on line, watching the notes appear on screen as you play them and printing it out afterwards: and there's nothing here like that.

"It's interesting that they've all taken different approaches. The only one that really *teaches* you about music is the *Musicmaster*. But they should all be easier to use. It should be a fun thing, not something you have to plough through huge manuals to understand. You should be able to just pull the music out with your fingers!"

Some light relief. This is a strategy game that allows you to try and crack the charts by leading your own group. Monthly turns allow your band to write songs, play gigs, go on expensive tours, push your manager into fixing special deals and acquiring status symbols and — eventually — make a record. If you've avoided bankruptcy, corrupt management and the apathy of the fickle public in the meantime, that is. Three skill levels in what's basically a text game, though there is a chance of seeing the group play live!

"A must for anybody who's ever picked up a guitar, I'd say! If there's a few of you playing it should be fun — I always find these games better when there's a few people gathered round calling out what to do. I like the pace of it — it moves fast enough to keep you interested. And it's not too easy either, even if the real thing is harder!"

Prog: IT'S ONLY ROCK'N'ROLL
Maker: K-TEL
Machine: SPECTRUM 48K/COMMODORE 64
Format: cassette
Price: £6.95

A program designed to make the computer operate as synthesiser, 4-track recorder and editing desk. It boasts 30 functions that work directly from the keyboard: 10 pre-defined pitch and amplitude envelopes offer a possible range of 100,000 envelopes, and four-channel recording can be simulated to enshrine tunes of up to 1,950 notes — more if the 'long-play' compressor facility is used. There's also a range of sound effects, a metronome facility and three ready-made files (Bach, Sousa and Xmas Carols). The basic graphic display is akin to a studio mixing desk layout.

"The preset tunes just show off some flash envelopes. It never actually *shows* you what's playing. It sounds passable — as the kind of thing Walter Carlos would have dreamed of 20 years ago — but a lot of the effects sound like artificial warbles and tweets. For anyone who wanted to use the program as a tool for making music it's good in a sort of roundabout way without showing or telling you much about what you're doing. There's a heavy onus on the user.

"Not very useful for the professional musician, and for someone who wants to learn about making music it's not too clear — you don't see any dots or scales anywhere. It seems like there's a lot there, and it claims to produce complex music quickly and easily — but that can't be done with a keyboard operating in real time — and that seems to be all you *can* do with it. There's no visual record of the notes you've played. Good bit of programming but I think you have to be able to play to make it work for you. It's harder than a piano keyboard."

Prog: BBC MUSIC PROCESSOR
Maker: QUICKSILVA
Machine: BBC MODEL B
Format: cassette
Price: £14.95

The Superior System

A very clear manual explains that this one will write 1, 2 or 3 part tunes which can be played or stored on the BBC. 16 pre-defined envelopes set up the sound characteristics for each note but these envelopes can be extensively modified; treble and bass staves are shown on the screen, and the cursor keys are used to select note positions. Tunes can be loaded from discs and there's a 256 note capacity for each.

"I should point out that I've been asked to write tunes for this program although I haven't actually written any yet. It's well laid out. It actually gives you a picture of the sound frequency you've chosen, though there's nothing very tutorial about it — it's aimed at people who know what they're about, as a serious tool. But your contact with it isn't too complex.

"You can approach it from whatever direction — as a computer user, musician or sound engineer — and I think it's very easy to understand. You can play back any part of a tune during the edit mode, very useful — the attitudes of the programme is to be helpful at all stages. To let you hear the tune build up. The machine gives you as much control as possible, and it's very good for getting the 'feel' of music. One drawback is that you can only see one line of music at a time even though you can hear as much of a piece as you want.

"It's certainly the best music program for the BBC, and the BBC is the best micro for this sort of thing. It's just a shame you can't write very long tunes on it."

Prog: MUSIC EDITOR
Maker: SYSTEM SOFTWARE
Machine: BBC MODEL B
Format: cassette/disc
Price: £9.00 (each)

KINDLY PAY ATTENTION CLASS!

A much simpler program: the rudiments of music theory are explained onscreen in either a stave or keyboard mode using step-by-step instructions on pitch, time etc. Tunes are then constructed, played and amended or stored as one wishes. There are no special FX to the program and the maximum length for a tune is 1000 notes.

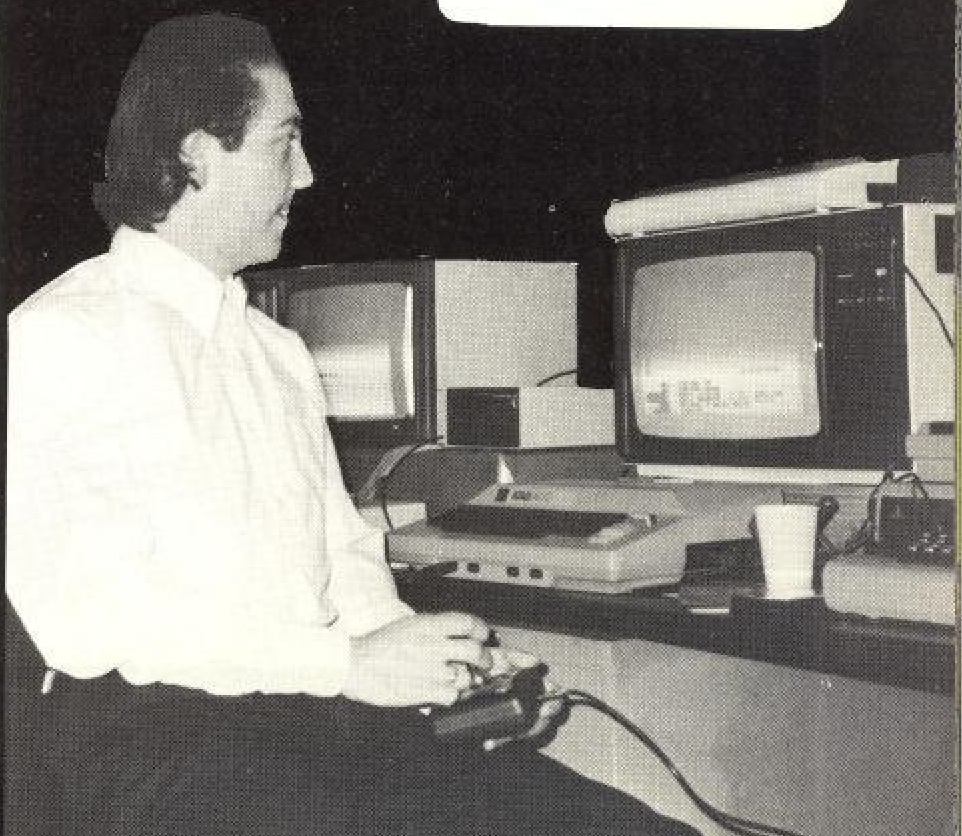
"It's all there on the screen — you don't need to keep looking at the manual, which is good. Shame it's for a machine where the sound is so poor. I like it a lot — it's very good refresher stuff on all the things you forgot at school! It tells you what you need to know about notes or whatever and the way it teaches you about each part of putting music together is very clear. You can go straight to any part of the process so it's very user-friendly. Presentation is excellent and the display is very clear."

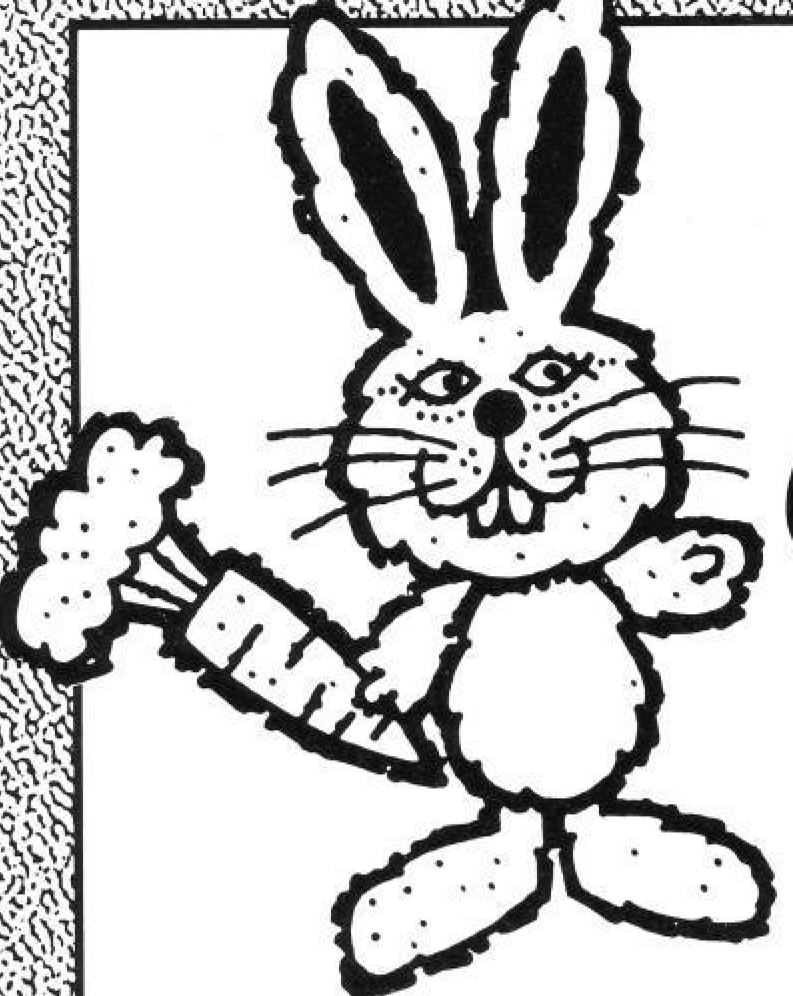
Prog: MUSICMASTER
Maker: SINCLAIR/INCOGNITO SOFTWARE LTD
Machine: SPECTRUM 48K
Format: cassette
Price: £9.95

THE SHELLEY CHART

1. System Software's *Music Editor*
2. Spectrum Software's *Musicmaster*
3. Bug-Byte's *BBC Music Synthesizer*
4. Quicksilva's *BBC Music Processor*
5. Quicksilva's *Ultisynth*

SPECIAL MENTION
(Light Relief Department)
K-TEL'S It's Only Rock 'n Roll





SAVE THE CHICKENS!

For any Spectrum **By RON RIDGE**

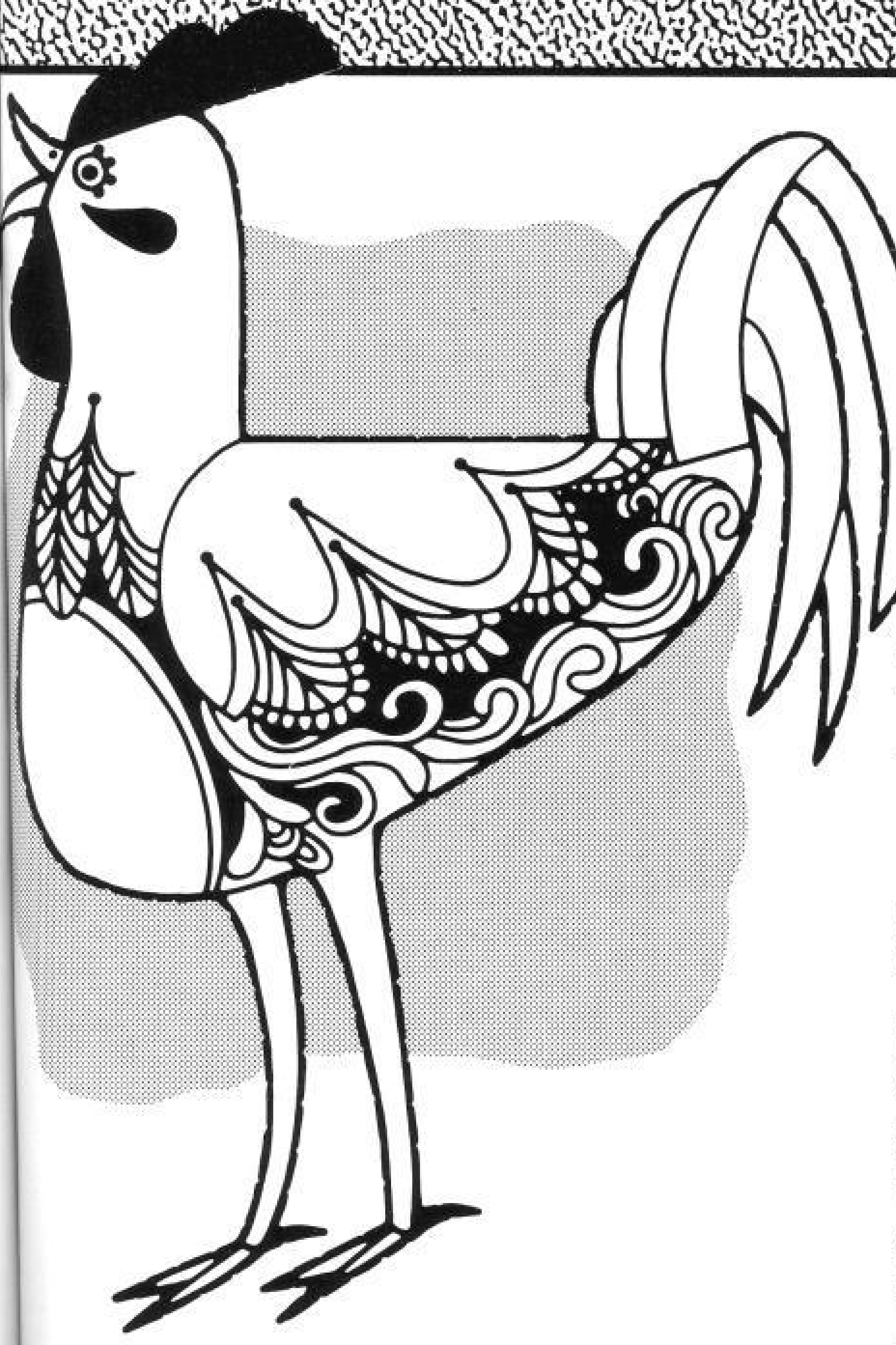
Embarrassing storyline, great game. There's these chickens, see, and for some reason (don't ask) you're responsible for steering the little feeders from the coop to the henhouse. Avoid the white rabbits (this goes for real life, too). Give the foxes a miss. Try not to fall down a hole (this also goes for real life). Tap on.

```
   0 REM CHICKENS © Ron Ridge
   1 INK 5: PAPER 0: BORDER 5: C
LS
   2 GO SUB 750
   3 GO TO 710
  20 INPUT PAPER 0; INK 7;" ENTE
R DIFFICULTY 10 - 20";f
  30 INPUT PAPER 0; INK 7;" ENTE
R LEVEL 6-15  (6 is easy)";l
  40 LET a$="▲": LET c$="▬": L
ET k$="ʃ": LET m$="●"
  50 LET sc=0: LET c=0: LET t=10
0: LET x=10: LET y=1
  60 REM ***position 5 eggs***
  70 FOR e=5 TO 30 STEP 6
  80 PRINT AT 2,e; INK 2;a$;AT 3
,e; INK 5;c$
  90 NEXT e
```

```
GRAPHICS NOTES
Line 40 : AB, CD, H, I
Line 120 : JK
Lines 130 410 430 450 : H
Lines 290 310 : E
Lines 320 360 : G
Lines 330 390 : F
Lines 420 440 460 : I
Lines 550 560 570 580 590 : L
Line 800 : AB, CD
Line 800 : 64+Gra.8
Line 780 : 32+Gra.8, G, 32+Gra.8
```





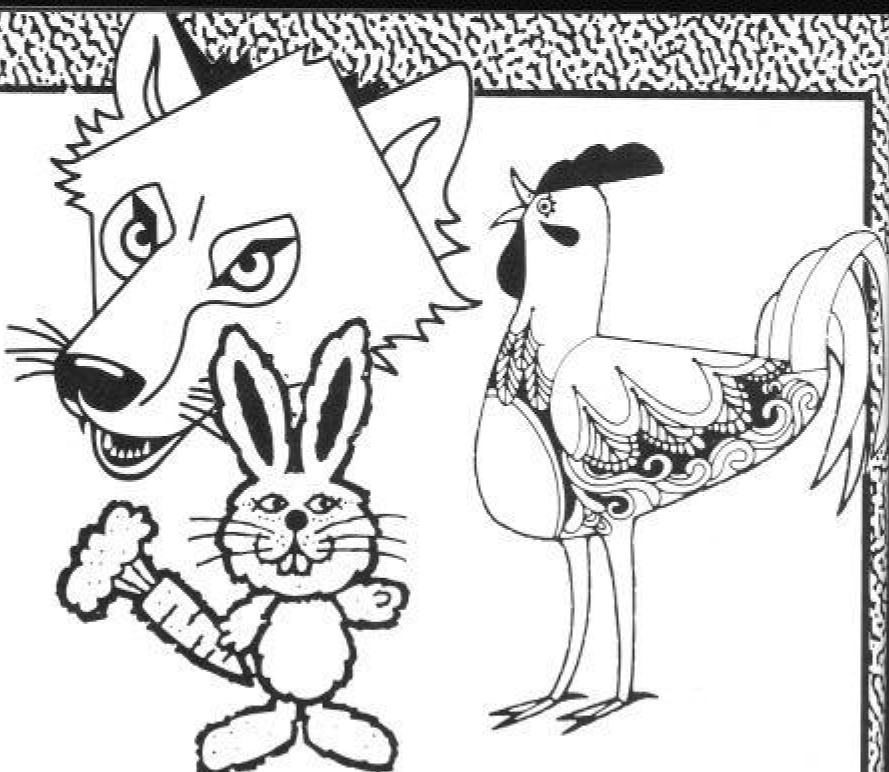


```
 100 REM house and rabbits
 105 FOR r=1 TO l
 110 LET rx=INT (RND*14)+5: LET
ry=INT (RND*27)+4
 120 PRINT AT 19,15, INK 4;"▲";
AT 20,16;"_"
 130 PRINT INK 7; BRIGHT 1;AT rx
,ry;"♦"
 140 NEXT r
 150 REM rabbit holes
 160 FOR h=1 TO l
 170 LET hx=INT (RND*14)+5: LET
hy=INT (RND*26)+4
 180 PRINT INK 1; BRIGHT 1;AT hx
,hy;m$
 190 IF m$=k$ THEN LET m$=k$
 200 IF k$=m$ THEN LET k$=m$
 210 NEXT h
 220 PRINT INK 6;AT 0,1;"SKILL L
EVEL ";l;AT 0,18; INK 5;"TIME LE
FT ";t;" "
 230 PAUSE 100
 240 REM open eggs
 250 LET r=INT (RND*6): LET s=r*
6
 260 IF s<6 THEN GO TO 230
 270 IF ATTR (1,s-1)=130 THEN GO
 TO 250
 280 LET u=2
 290 PRINT INK 2; FLASH 1;AT 1,s
-1;a$; FLASH 0;AT 2,s-1;"  ";AT
u,s-2; INK 6; BRIGHT 1;"*": BEEP
 .1,45: BEEP .1,50
 295 IF INKEY$<>"6" THEN GO TO 2
90
 300 REM move chicken
 310 IF INKEY$="6" THEN LET u=u+
1: PRINT INK 6;AT u-1,s-2;"*": P
RINT AT u-2,s-2;" ": GO SUB 500:
 IF ATTR (u,s-2)=71 OR ATTR (u,s
-2)=65 THEN GO TO 410: IF u>21 T
HEN LET u=21: PRINT AT u,s-2;" "
 320 IF INKEY$="5" THEN LET s=s-
1: PRINT INK 6;AT u-1,s-2;"*";AT
 u-1,s-1;" ": GO SUB 500: IF ATT
R (u-1,s-3)=71 OR ATTR (u-1,s-3)
=65 THEN GO TO 430
 330 IF INKEY$="8" THEN LET s=s+
1: PRINT INK 6;AT u-1,s-2;"*": P
RINT AT u-1,s-3;" ": GO SUB 500:
 IF ATTR (u-1,s-1)=71 OR ATTR (u
-1,s-1)=65 THEN GO TO 450
 340 REM 'home' * stop at edges
 350 IF u-1=20 AND s-2=16 OR u-1
=20 AND s-2=17 THEN PRINT AT 21,
10; INK 6; PAPER 1; FLASH 1;" HO
ME SAFELY ": FOR k=1 TO 20: BEEP
 .05,k: NEXT k: LET sc=sc+1: GO
TO 530
 360 IF u>21 THEN LET u=20: PRIN
T AT 21,s-2;" "
 370 IF s<0 THEN LET s=0
 380 IF s>31 THEN LET s=31
 390 PAUSE 10: GO TO 310
 400 REM hit rabbits and holes
 410 IF ATTR (u,s-2)=71 THEN PRI
NT AT u-1,s-2;" ";AT u,s-2; INK
2; PAPER 7; FLASH 1;"♦": GO TO 4
70
 420 IF ATTR (u,s-2)=65 THEN PRI
NT AT u-1,s-2;" ";AT u,s-2; INK
2; PAPER 7; FLASH 1;"●": GO TO 4
80
 430 IF ATTR (u-1,s-3)=71 THEN P
RINT AT u-1,s-2;" ";AT u-1,s-3;
INK 2; PAPER 7; FLASH 1;"♦": GO
TO 470
 440 IF ATTR (u-1,s-3)=65 THEN P
RINT AT u-1,s-2;" ";AT u-1,s-3;
INK 2; PAPER 7; FLASH 1;"●": GO
TO 480
 450 IF ATTR (u-1,s-1)=71 THEN P
RINT AT u-1,s-2;" ";AT u-1,s-1;
INK 2; PAPER 7; FLASH 1;"♦": GO
TO 470
 460 IF ATTR (u-1,s-1)=65 THEN P
RINT AT u-1,s-2;" ";AT u-1,s-1;
INK 2; PAPER 7; FLASH 1;"●": GO
TO 480
 470 PRINT AT 21,5; INK 1; PAPER
 6; FLASH 1;" YOU RAN INTO A RAB
BIT!": BEEP .4,20: PAUSE 100: GO
 TO 630
 480 PRINT AT 21,4; INK 2; PAPER
 7; FLASH 1;" FELL INTO A RABBIT
 HOLE!": BEEP .4,10: PAUSE 100:
GO TO 630
 490 REM check time * move fox
 500 LET t=t-1: PRINT INK 6;AT 0
,28;t;" ": IF t=0 THEN PRINT AT
8,5; INK 2; PAPER 7; FLASH 1;" Y
OU RAN OUT OF TIME! ": BEEP .4,1
0: BEEP .4,20: GO TO 630
 510 LET a=INT (RND*f)
 520 IF a<5 THEN RETURN
 530 IF x<3 THEN LET x=3
 540 IF x>18 THEN LET x=19
 550 IF x<u-1 THEN LET x=x+1: PR
INT INK 2;AT x,y;"▼";AT x-1,y;"
"
 560 IF x>u-1 THEN LET x=x-1: PR
INT INK 2;AT x,y;"▼";AT x+1,y;"
"
 570 IF y<s-2 THEN LET y=y+1: PR
INT INK 2;AT x,y;"▼";AT x,y-1;"
"
 580 IF y>s-2 THEN LET y=y-1: PR
INT INK 2;AT x,y;"▼";AT x,y+1;"
"
```

Continued on next page

```
 590 IF ATTR (v-1,s-2)=2 OR ATTR
 (X,y)=6 THEN PRINT INK 2; PAPER
 7; FLASH 1;AT v-1,s-2;"▼";AT 21
,3;" THE RED FOX GOT THAT CHICK
": BEEP 1,10: BEEP 1,5: PAUSE 10
0: GO TO 630
 600 REM return to main loop
 610 RETURN
 620 REM end game
 630 LET c=c+1: IF c=5 OR t=0 TH
EN PAUSE 100: PRINT INK 1; FLASH
 1; PAPER 7;AT 10,11;" GAME OVER
": PAUSE 50: PRINT AT 12,5; INK
 1; PAPER 7; FLASH 0;" YOU SAVED
 ";sc;" CHICKENS ": GO TO 660
 640 REM clear screen & return
 645 LET s$="

 650 FOR a=4 TO 21: PRINT INK 4;
AT a,0;s$: NEXT a: GO TO 110
 660 PAUSE 200: PRINT INK 7;AT 2
1,0;"WOULD YOU LIKE ANOTHER TRY
(Y/N)": PAUSE 0
 670 IF INKEY$="Y" OR INKEY$="y"
 THEN CLS : GO TO 40
 680 IF INKEY$="N" OR INKEY$="n"
 THEN GO TO 700
 690 IF INKEY$<>"Y" OR INKEY$<>"
N" OR INKEY$<>"y" OR INKEY$<>"n"
 THEN GO TO 660
 700 CLS : PRINT AT 10,3;"O.K. P
ERHAPS THE CHICKENS      WOULD B
E BETTER ON THEIR OWN!": STOP
 705 REM instructions
 710 PRINT AT 1,6; INK 6; PAPER
 1;" SAVE THE CHICKENS "
 720 INK 7: PRINT AT 3,1;"Five c
hicks are ready to hatch  and yo
u must guide them safely  to the
 green hut entrances with keys 5
 6 8.(start with key 6)."
 730 PRINT '"  If your chicken h
its a white      rabbit or falls i
nto a blue      rabbit hole it wi
ll be lost.": PRINT '"  A viciou
s red fox is on the        prowl an
d will chase and try      to catch
 the chickens.": PRINT '" You h
ave only a limited time to guide
 all your chickens home."
 740 PAUSE 50: PRINT #1;"     PRE
SS ANY KEY TO BEGIN ": PAUSE 0:
CLS : GO TO 10
 750 REM graphics
 760 FOR I=USR "A" TO USR "L"+7:
 READ A: POKE I,A: NEXT I
 770 DATA 1,3,7,15,15,31,31,63
 780 DATA 128,192,224,240,240,24
8,248,252
 790 DATA 63,63,63,63,31,31,15,3
 800 DATA 252,252,252,252,248,24
8,240,192
 810 DATA 28,28,8,127,62,28,20,5
4
 820 DATA 12,14,200,126,254,252,
32,24
 830 DATA 48,112,19,126,127,63,4
,24
 840 DATA 8,8,24,24,13,30,14,28
 850 DATA 60,126,255,255,255,255
,126,60
 860 DATA 3,1,3,7,14,30,63,127
 870 DATA 192,128,192,224,112,12
0,252,254
 880 DATA 129,255,219,126,66,102
,60,24
 882 REM set up title screen
 885 PAPER 0: BORDER 0: CLS
 890 FOR x=0 TO 20 STEP 5: FOR y
=0 TO 30 STEP 3
 900 PRINT INK 2;AT x,y;"▲";AT
x+1,y; INK 5;"■"
 910 BEEP .02,y: NEXT y: NEXT x
```



```
 920 PRINT INK 0;AT 10,0;"

                                   "
 930 FOR x=0 TO 29: PRINT AT 10,
x; INK 6;" ♣": PAUSE 5: BEEP .1,
50: NEXT x
 940 LET w=32: FOR n=1 TO 90: LE
T w=w-1
 950 IF w=-1 THEN LET w=31
 960 PRINT AT 2,w; INK 0;"

                              "; INK
 6;"♣-"; PAPER 7; INK 1;" SAVE T
HE CHICKENS "; INK 0;"
                                   "
 970 BEEP .05,50: NEXT n
 980 PAUSE 100
 990 CLS
1000 RETURN
```

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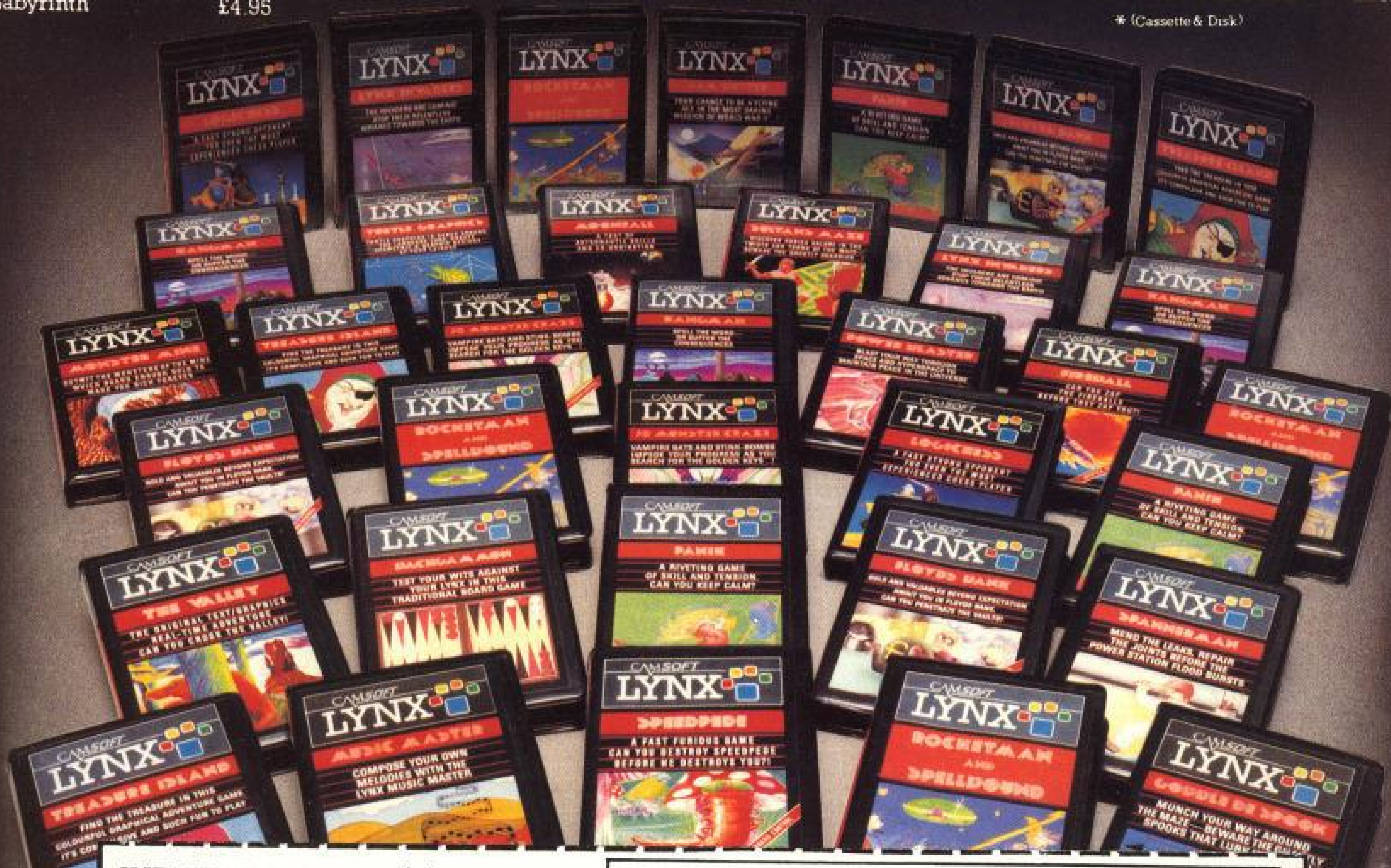
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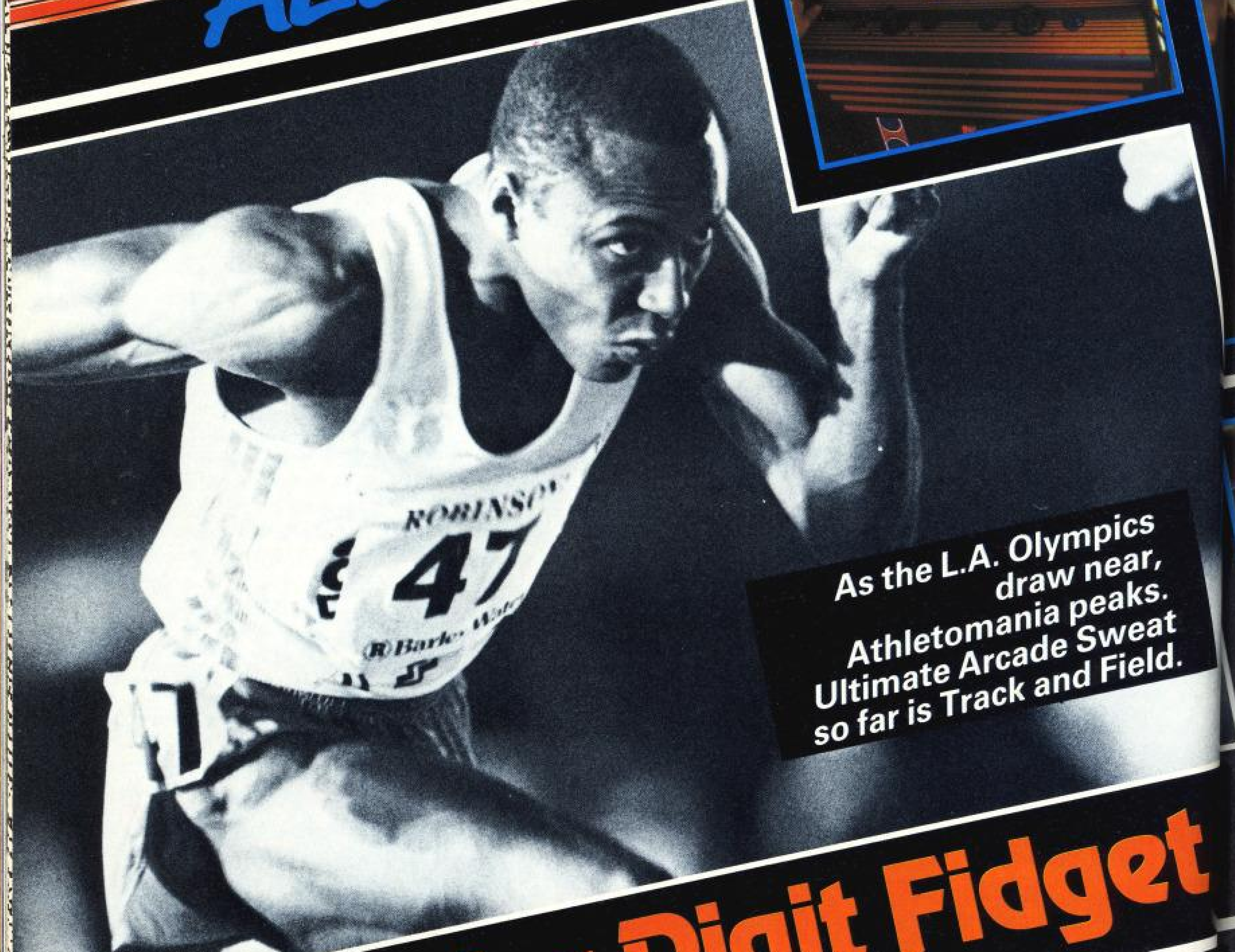
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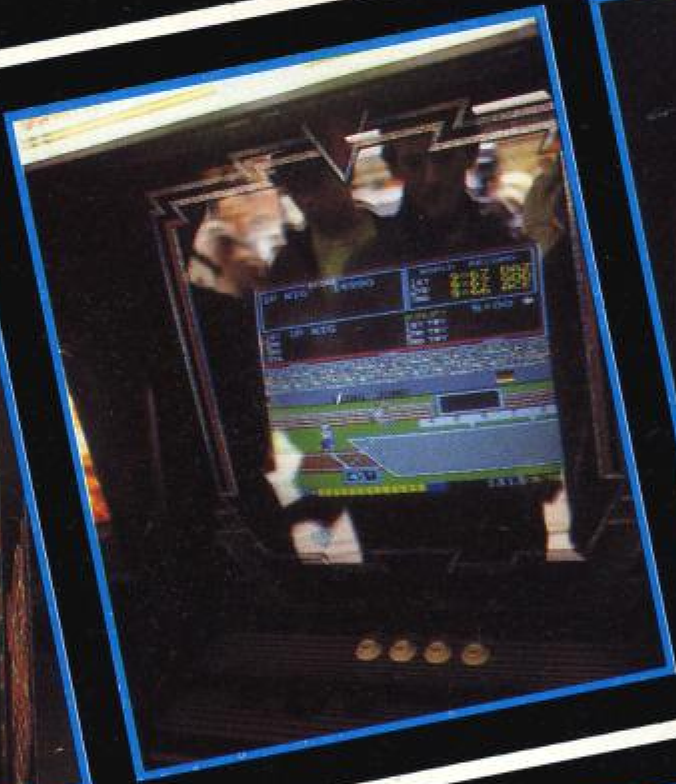
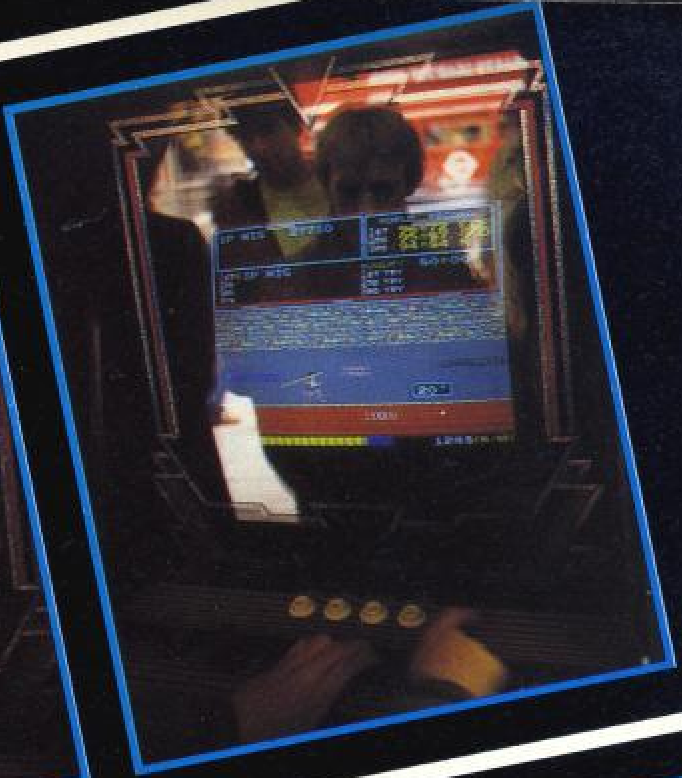


As the L.A. Olympics draw near, Athletomania peaks. Ultimate Arcade Sweat so far is Track and Field.

A Cure for Digit Fidget

STRANGE AS it may seem, a certain drunken friend of mine can now out-sprint the admirable Ade Mafi. He can also, after four or five pints of Foster's, flop better than Mr. Fosbury and part the hurdles faster than Ed Moses. Sadly though, you will not find him competing for the British Squad at this summer's L.A. Olympics. Nor will you find his startling feats recorded in the record books. For he has achieved all of these mini-miracles on Taitel/Konami's athletic arcade game, *Track and Field*.

Based loosely on what could be called a hexa-tholon, *Track and Field* is comprised of six sporting events, each surprising in their accuracy and real-ism. For twenty pence you get the chance to fight it out with up to four players (or the computer) for honours in the 100m sprint, and long-jump, the javelin, the hurdles, the hammer and the high-jump. Qualification for each round depends on your ability to satisfy the stipulated speed/height/distance set by the machine; in all events bar the sprint and the hurdles the player has three attempt






to qualify for the next heat. Of course none of this is as easy as first appears.

Points are awarded on merit in competition and bonuses come in the occasional form of a be-hatted figure with a 1,000pt. bill-board, or, if your javelin flies off-screen, in the shape of a speared pigeon (?).

But what puts *Track and Field* way above most games is the feeling that you are actually competing for something real (this is even more apparent when your opponent knocks your elbow during the 100m sprint). To play successfully you need a degree of dexterity and judgement that would confound the majority of RAF pilots. Your speed must be gauged exactly and your angle of take-off or release as close to the optimum as is humanly possible (and all this with your rivals blowing smoke in your face and stealing your scotch). If it wasn't for the game's addictive power I'd take a jump-jet to the Falklands anyday.

Still, the complexity of the actual game is nothing when compared to the abundance of animation that constitutes *Track and Field's* software program; referees shoot starting pistols (to the audible cry of 'ON YOUR MARKS, GET SET, BANG') and the hand-measure distances, crowds offer standing ovations to winners and seated silence to losers, athletes scratch their heads in bemusement at disqualification and salute with pride to their victories — and, if you finally reach the champions' plinth, you are awarded a gold medal and a nubile blonde to present it (complete with kiss). All that's missing are the free Anabolic Steroids.

Not ones to miss out on the game's obvious success, the International Athletes Club has arranged a national competition with the makers aimed at raising money for out poverty stricken Olympics team — and that is an incentive to play.

Track and Field? It's leading the pack by a mile!

DAVID DORRELL

System 3 Software...Graphically Amazing!

DEATH STAR INTERCEPTOR

LAUNCH

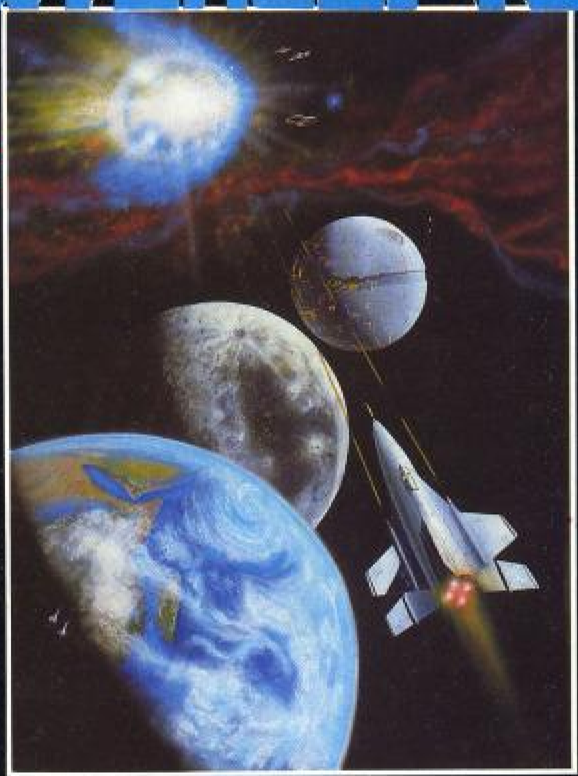


(Screen 1)

DURANIUM BARRIERS



(Screen 4)



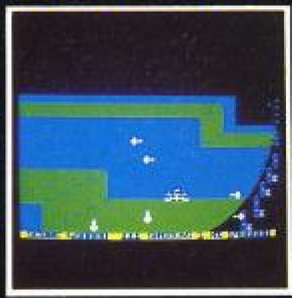
NEW!

APPROACH



(Screen 2)

INTERCEPT MISSILES



(Screen 6)

ENTRY



(Screen 3)

...Earth is threatened by an Empire Deathstar, can you penetrate its defences and destroy it before it destroys you?
52K of pure machine code to give you 12 screens of 3D graphics, super smooth 3D animation, unbelievable sound effects music, 4 skill levels and hiscore table . . .this is the ultimate challenge?
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VICTORY



(Screen 12)

CAN YOU REACH IT?

LASER CYCLE





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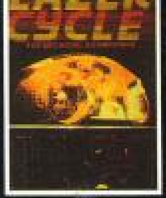
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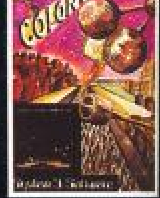


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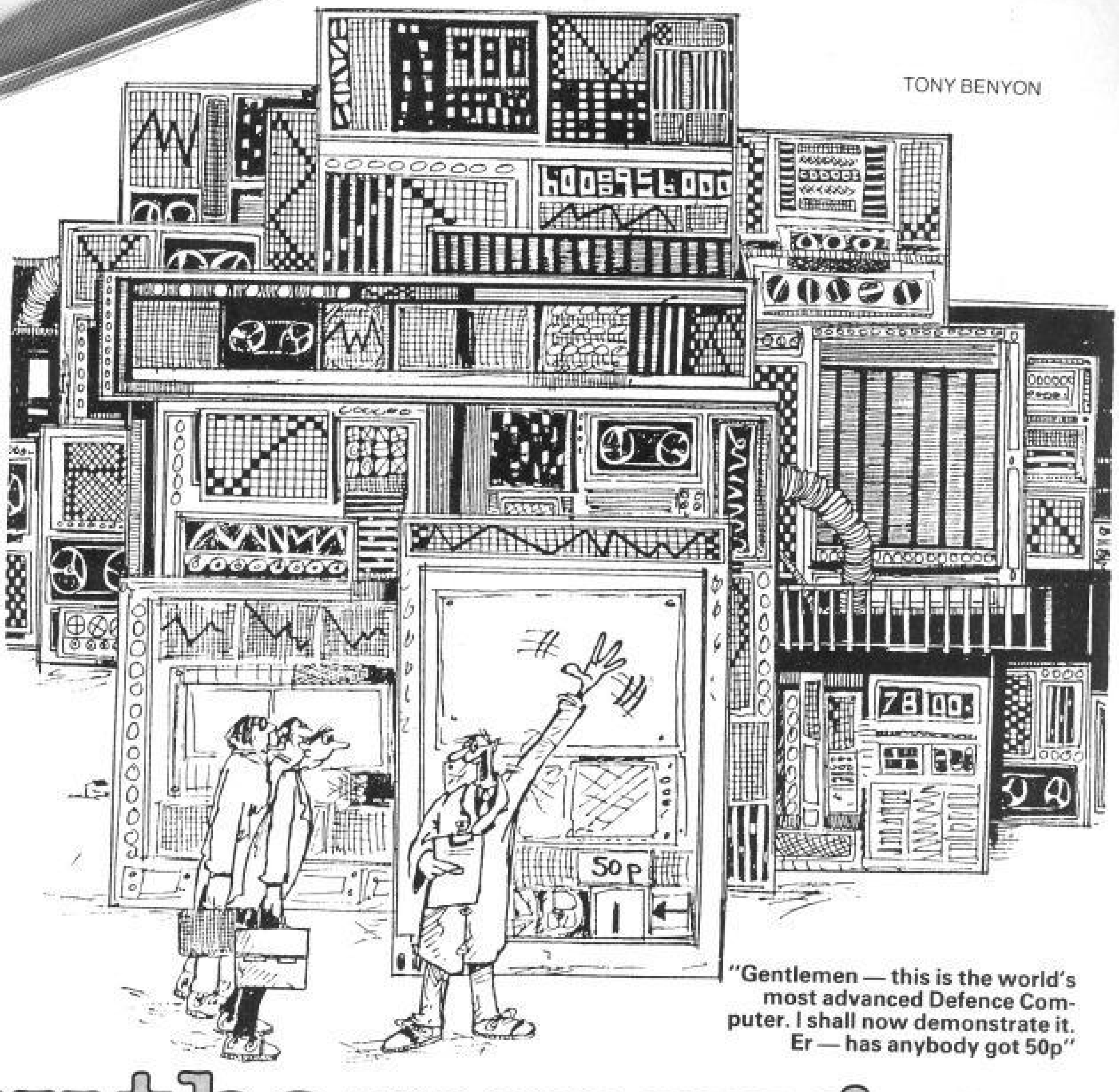
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ARCADE ALLEY

TONY BENYON

Ever wondered what happens to your 10p pieces once they've clanked down the iron throat of the machine of your choice? Like, who gets how much — and why?

DAVE RIMMER has been making pie-charts . . .



"Gentlemen — this is the world's most advanced Defence Computer. I shall now demonstrate it. Er — has anybody got 50p"

That's the way the money goes

EVERY YEAR, in early Spring, Kensington Olympia plays host to the arcade game industy's annual show. Manufacturers display all their new games: distributors and arcade owners roll up in force to try them out.

The trick is simple: deciding just which of the scores of games on offer are most likely to get the coins popping in over the year to come. Or is it simple? Inevitably, one game becomes the star of the show. When there's no time to get to know a game, quality graphics are usually the lure. But quality graphics alone do not a successful game make and, almost as inevitably, the star will turn out to be a turkey. In 1983 everyone went for *Astro-Blaster*. The whole trade tried it, loved it and bought it. It flopped. Disastrously.

"We're dealing with a fashion industry," shrugs Frank Manzi, co-director of Regent Automatics, a distributor for fruit machines, juke boxes and pool tables as well as video games. "It really is a pig in a poke."

And it seems like it always has been. In the late '70s, when the first primitive "paddle-bat" games like *Ping-Pong* and *Breakout* came on to the market, the games industry leapt on them. No-one made money out of them, though, and for a time it put the industry of video games altogether. When *Space Invaders* first came out, the trade just didn't want to know. Then *Space Invaders* took off. There was, Frank Manzi remembers with a smile, "an almighty rush".

On the crest of this sudden wave, all sorts of new companies came sweeping into the business. Most of them went broke. It seems that nobody had really cranked through the economics of it all.

"You used to get people putting ten machines in one grotty corner caff," Manzi smiles. "That's maybe thirty grand's worth of machines when you wouldn't have bought the whole caff for five grand."

The companies that survived were those, like Regent, who had the backing of their outlets and provided a range of equipment. Regent will provide a pub, say, with all its equipment and the juke boxes and fruit machines and pool tables kept them going through the time when video games weren't making money.

It's still not easy. The reliable old fruit machine is still the backbone of this lark, and a lot of local arcades that a couple of years back went big on video, have given up on lasers and aliens and gone back to holds and nudges. As far as games go, it's picking the sites that is the problem.

"You've got to be picky about your sites," reckons Manzi. "You can have one pub that's a *marvellous* site. But the one round the corner might be an absolute stinker."

And it's not even as simple as that. Some games do well on some sites, but not on others. "It's horses for courses," Manzi says, and even if you know everything there is to know about new games (Manzi refers to the American *Joystik* magazine) and have tried them all out personally (his current favourite is *Food Fight*), you still can't predict with any degree of certainty which one will coin it where.

Here's how it works. A company like Regent buys a machine, puts it on a premises and then splits the takings with the owner. It used to be 50/50 but it's increasingly 60/40, with the larger share going to the distributor. As the games get more sophisticated, the price goes up. And if the price increases, so must the distributor's share. Some are too expensive for a company like Regent to operate at all. With a laser game like *Dragon's Lair,* Manzi reckons he would need 80% of the take to make any money. This means the site wouldn't make enough to want to bother.

Usually, though, a site who after all aren't paying anything for a machine, will be happy with what they can get. A distributor on the other hand has overheads: people to empty the machines, engineers to repair them.

The average life for any one machine on any one site is a mere 16 weeks. Exceptions? Manzi can think of only two: *Mr Do* and *Asteroids.* He has one site — a recording studio — which has had an *Asteroids* machine for three-and-a-half years.

"Initially they're all great, but you don't know how long they'll last. People poo-pooed *Mr Do* when it first came out. In fact I sent the first one back. And then it turned out to be one of the best ones. If they're too clever, though, they'll do nothing at all. Like *Gravitar,* that's a bloody intellectuals' game!"

"You know," he sighs, "you'd be surprised how sophisticated the public are. You wouldn't believe an arcade customer is as selective as he is. He wants a clean, well-lit arcade. He doesn't want junky games that don't offer a challenge, he wants a change every now and then. It might be different in seaside arcades, but in towns the 16-week rule applies."

GOAD YOUR CODE...

. . . the 6502 Way. In the third part of ANDY GREEN'S series, he shows you how to get great shapes on your TV screens.

PART THREE

BOTH THE BBC 'B' and the Oric, in common with most other home computers, use a display system known as Memory Mapped Graphics. This means that the video hardware uses information that the processor puts in a shared chunk of memory to form the display.

If the screen matrix is formed by 240 by 200 pixels, as on the Oric's Hi-Res mode, and each pixel can be white or black, then the status of each pixel can be represented by the contents of a single bit. You'd need 48,000 bits to define the status of all the pixels, or 6K bytes (8 bits to a byte).

So if each pixel can be any of a number of colours, then more bits are needed to define it's colour. Computer manufacturers always choose 2, 4, 16 or even 256 colours per pixel because numbers of bits needed that are factors of 8 are easier to design.

For example, on the BBC mode 2 screen (with 16 possible colours to each pixel) a quick glance at table 1 shows that each pixel needs 4 bits. With 160*256 resolution, that's a total of 40960 pixels, and at 4 bits per pixel, you're going to need 40960*4 = 163,840 bits or 20,480 bytes: 20K.

So . . . more colours per pixel in nice, but it sure munch up dat memory. Note also that because you need to push a large chunk of memory about to create large shapes on the screen, memory mapped graphics are inherently slow. Sprites, as used in the Commodore 64, MSX and MTX micros get rid of this hassle by having a special chip which, when given co-ordinates, displays a shape in the appropriate place with no further orders from the processor.

Moving dot

Here's a little background on how TVs work:

The TV controls a single moving dot that scans in a repetitive, set pattern, changing colour as it moves to form the piccy. The dot moves so fast that we are fooled into seeing a constant image. Figure 1 shows the scan pattern used to move the dot over one complete screenful or field, and figure 2 shows how each individual line is scanned. After 312-odd lines, the scan is pulled back up to the top left ready for the next field. Each line in the field is known as a scan line.

As you can see, all this is happening pretty quickly — a field is completed 50 times a second, so you can imagine how fast that dot must be moving!

Let's recap on the vital statistics of the BBC's mode 2 display: It's 160 by 256 pixels, each pixel's colour being defined in four bits. There being 8 bits to a byte, you can define two pixels in each byte. Since at two pixels a byte 160*256 pixels will take up 20K (=&5000), if the screen ends at &8000 it must start at &8000-&5000 = &3000.

Figure 3 shows the placement in the screen memory of around the top-left pixels at &3000 for a BBC in mode 2. Note that each pixel is one scan line high.

Mshape secrets

You ever noticed how some games have got really smooth graphics while others seem to jerk and shuffle about?

Yeah? Here's how they get the smoothness . . . Move each mshape either just once every field (i.e. once every 1/50th of a second) or once every other field. The new position can only be seen once during a field, so it's pointless wasting time moving it more than once. *FX19 on the Beeb will wait unitl the start of the next field, so if you move all the stuff that needs moving, do an *FX19 to wait until the next field, and loop back to move allthe stuff again, your graphics will be very, very slick and smooth.

The Mshape generators in Listings 1 and 2, for the BBC and Oric respectively (although both run on the BBC) enable you to create mshapes of up to 16 by 16 pixels, and store these on disc in the file SFILE. These mshape definitions can then be used in your programs, as shown later on.

Type in the appropriate listing, then the following:

```
?&3000=0: *SAVE SFILE 3000
          3001
```

to set up an empty shapefile.

Now RUN the program, and you'll see the main menu. Option 'A' is used to add on a new mshape, and it'll ask you two questions about the mshape's size. When it asks "Number of Bytes across", remember that on the BBC there's 2 pixels to the byte, on the Oric, 6.

When you've responded, the screen clears and presents you with a grid and a cursor, which you control with Joystick One. With the BBC version, move the cursor down to the row of colours and press fire to select a new colour, then move in the grid, pressing fire to 'drop' a colour in the right place.

TABLE 1

COLOURS/PIXEL	NO. OF BITS NEEDED
2	1
4	2
8	3
16	4
32	5
64	6
128	7
256	8

Note that shaded entries are hard for the hardware people to implement because the number of bits needed isn't a factor of 8.

On the Oric version, pushing fire when in the grid simply changes black-white and white-black. Put your cursor over where it says "exit" and hit fire when you're finished.

Option B enables you to edit a particular mshape. This simply takes you back to the editing grid as in 'A'. Note that the mshapes are numbered from zero upwards.

Option C is used to delete mshapes. Note that if you've got four mshapes, and you delete shape 1, then shape zero remains the same, shape 2 becomes shape 1, and shape 3 becomes shape 2; watch out.

Option D simply saves the current mshape configuration to disk.

Option E enables you to copy a certain mshape into another. Note you must first create the 'recipient' shape. The first shape number requested is the source shape, and the horizontal and vertical offsets represents a displacement that will be added while moving. For example, if a horizontal offset of 1 and a vertical offset of 0 is used, then the copy will be made one pixel to the right of the original. The second request for a mshape number refers to the 'recipient' mshape's number. Make sure that the recipient is big enough to contain the new shape if you use an offset.

The reason for option F is a little complex, to say the least . . . there are two main methods of spraying shapes on the screen — simply pulling the mshape data out of a table and storing it straight into the appropriate piece of screen memory, or doing an exclusive-OR with the original contents first.

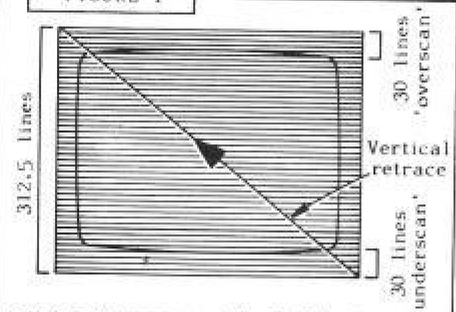
With the first method (used in *Snapper*) of two shapes that overlap, the last to be sprayed will cover the disputed territory, rubbing out its unfortunate forerunner as if it had never existed. It takes two calls to the shape sprayer to get such a shape to move a pixel . . . rub out the old shape by spraying a blank in its place, and spray up the new one in the next position along.

Spray those pixels

With normal Exclusive-OR (hereafter EOR) -ing, it still takes two sprays to move something a pixel, but in not quite the same way. If you spray a mshape up in the same position twice, using EORing, after the first spray the mshape will appear, and after the second spray the mshape will disappear! More accurately, after the second spray the pixels that were covered during the mshape's first appearance will return to the colours they originally contained. Okay — EOR the shape in once, it appears; EOR the same shape in the same place again and it disappears.

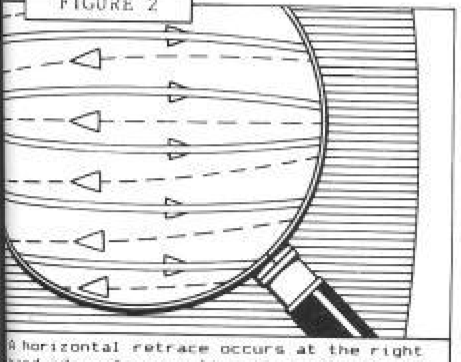
If two mshapes overlap, using EORing, then in the overlap area the colours go wrong. But EOR out one of the shapes, and the

FIGURE 1



How the TV scans a whole field. A new field is started every 20ms or once every 1/50th of a second.

FIGURE 2



A horizontal retrace occurs at the right hand edge of every line to return the dot to the left hand starting point of the next. The dot is always turned off during this.

colours on the remaining shape within the overlap area go OK again. EORing is non-destructive . . . check out figure 4.

Big flaw in the above methods: flicker. For a little bit of time, during and after we're blanking the old shape's position, there's no sign of the shape at all on the screen. If the TV happens to have scanned this area before you can get your shape back in its next position, it displays the blank.

Sure shot shapes

What we really need is a 'one shot' spraying method that simultaneously destroys the old image whilst reprinting the new.

First you gotta create an 'original' shape, which is going to be the basis for the 'one-shotters'. Take a *Space Invaders* style laser base, for example. This can only move laterally (left/right for all you illytterite slobs out there), so we need to make one 'one-shotter' only — a lateral. Some shapes need to be able to move only up or down (lasers, bombs), and hence need a vertical one-shotter only. Some will need to be able to move in any of the four directions, and so will need both lateral and vertical one-shotters, which one is used being decided by the program.

A source file called MSHAPE is also given. It contains the SDO (shape do) routine for the BBC and Oric, which, given the X and Y co-ordinates, will EOR a particular shape onto the screen, with the top-left pixel of the shape being placed at (X, Y). The X co-ordinate you want the shape at is stored (surprise!) in a location called 'X', with the Y co-ordinate in (you got it!) 'Y'. Don't mix these up with the index registers X and Y . . . in this context, X and Y are labels.

Both co-ordinates are measured in pixels, with (0,0) being the top left of the screen and (159,255) being the bottom right pixel. You then load up the Accumulator with the shape you want, do a JSR to SDO, and Zonk! there's your shape.

So, by way of example: If we wanted shape 0 at (79,127), ie around the middle of the screen, then we'd

```
"
"
LDA #79 /set the X co-ord to 79
STA X
LDA #127 /set the Y co-ord to
            127
STA Y
LDA #127 /set the Y co-ord to
            127
STA Y
LDA #0 /we want shape zero
JSR SDO /now spray the shape
"
"
```

Note that the top-left pixel of the shape would appear at (79,127), the rest appearing to the right and downwards of this point.

After the SDO routine is INIT (short for initialisation), which is where the program starts from when you execute it. At the moment there's a little program to test the SDO routine. To use it, make shape 0, then create shape 1 one byte longer in the X direction. They copy shape 0 into shape 1 using option E, with a horizontal offset of 1 and a vertical offset of 0. This makes shape 1 the same as shape 0 but one pixel to the right.

Now use option F to EOR shape 0 with shape 1 to get a one-shotter for moving horizontally into shape 1. Save the table to disc, and assemble the test program by chaining 'A' (CALL#9700 on the ORIC after running A).

Execute the BBC version by pressing f4, with Shift-Break to exit, and the ORIC version by typing HIRES:CALL#600, the 'reset' key to exit back to Basic.

To the example game, *Maelstrom*, then. The dot matrix is on the wall, as I've often said before, for simple one or two-screen games such as *Space Invaders*. The only exception to this comes in the form of *Sinistar*. A deep resonant voice echoes out of The Machine: 'Behold! I Live!'. As you try to peg off into a corner to hide from this nightmare, it chases you taunting 'Coward!!'.

Sinistar compensated for the fact that simple zap-the-alien theme gets boring if the premises are static.

Another way of getting around the familiarity breeding contempt problem is regularly changing the gameplay by including several parts. Arcade games are already mutating into a single title covering several different screens.

This probably being your first home made arcade game, *Maelistrom* won't tax your brain too heavily. As you will discover, the gameplay occurs on a cross-grid. Several Nasties of various shapes and sizes erupt from the edges of the cross and rush inwards. You control an axial deflector (jargon always welcome here) that you can move about the grid. At the end of each 'roadway' is a symbol, and you've got to re-route the Nasties into their appropriate symbols. Two nasties mustn't touch.

Whenever a nastie runs into your deflector, it turns at a right angle, which way depending on how you've deployed the deflector, which can be in any of four directions.

Now: a word about Vicious Nasties. Arcade game players' hands are stained with the blood of a hundred Alien hues. In another place, cyborg coolant fluid spills pumping to the dry, thirsty alien soil as each robot utters its last metallic croak, before, er, croaking.

Background scene

If you read a lot of SF, then it's okay to have a futuristic background story. Otherwise forget it. Try fitting it to a 'cute' real life scenario . . . like *Frogger* and *Pengo*. There are quite enough Buxom Blondes being carried off by leering green Humanoids, thanks. Some of Quicksilva's cassette inserts have been quite good (they put little stories on the back, written by themselves) but others have been a load of crap.

Anyhow, with eight shapes all hurtling towards the wrong symbols, and you can only deflect one at a time, it's going to be fun. There's also renegade shapes that have to be left alone, and Attractors that move twice the speed but must be touched.

Next time we start on the game proper!

FIGURE 3

	Ø	1	2	19
0	&3ØØØ	&3ØØ8	&3Ø1Ø	&3278
1	&3ØØ1	&3ØØ9	&3Ø11	&3279
2	&3ØØ2	&3ØØA	&3Ø12	&327A
3	&3ØØ3	&3ØØB	&3Ø13	&327B
4	&3ØØ4	&3ØØC	&3Ø14	&327C
5	&3ØØ5	&3ØØD	&3Ø15	&327D
6	&3ØØ6	&3ØØE	&3Ø16	&327E
7	&3ØØ7	&3ØØF	&3Ø17	&327F
8	&328Ø	&3288	&329Ø	&34F7
9	&3281	&3289	&3291	&34F8
10	&3282	&328A	&3292	&34F9
11	&3283	&328B	&3293	&34FA

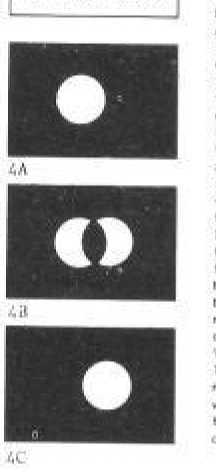
☐ =1 pixel

MODE 2 ADDRESS MAP

HOW EOR WORKS

EOR TRUTH TABLE

A	B	R
1	1	0
1	0	1
0	1	1
0	0	0



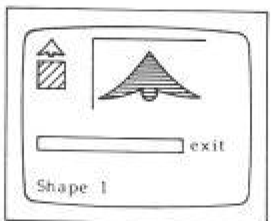
4A

4B

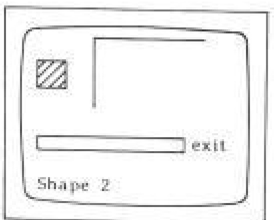
4C

Examine the truth table. Imagine you are in a two color mode: 1=white, 0=black. The whole screen is black (=0) and you EOR a circle. (Fig.4A). The circle appears because the 1's that make the circle template are being EOR'd with the zeros that were originally there. 1 EOR 0=1, therefore the circle appears. If we tried to EOR the same circle in the same place again, the 1's that make up the circle template would match up with all the 1's in the screen already; 1 EOR1=0, so the circle is replaced by zeros, ie it disappears. Now, imagine that we are back with figure 4A, and we tried to EOR the shape in 4B, with the left-most circle lined up with the circle in 4A. The bits that were white in both would become black (1EOR1=0), while the bits that were both black would remain black. White EOR black, or black EOR white give white. You end up with the shape in 4C - The circle has moved to the right. To move it to the left, we simply align 4B on 4A so that the right hand part is over the circle in 4A. Wow!

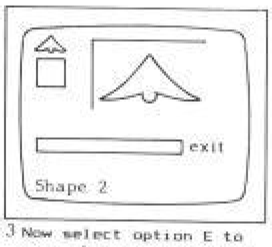
FIGURE 4



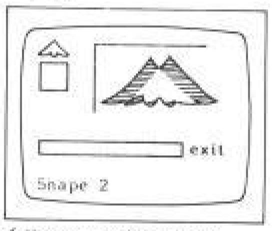
1 Design the original shape first, using option A.



2 Now create shape 2, which will be the 'one shot' for moving shape 1 to the left or right. Shape 2 must be 1 pixel wider than shape 1. Leave it empty for the moment, and exit to the menu.



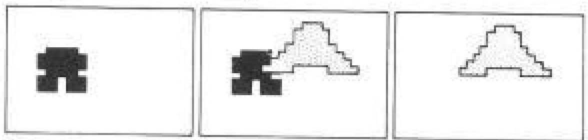
3 Now select option E to copy shape 1 into shape 2, offset by 1 horizontally, and vertically.



4 Now use option F to merge shape 1 and shape 2 together to form the 'one shot'.

FIGURE 5

WHAT ON EORTH?



1 Spray up the Space Invader using EOR - it appears normally.

2 If you spray up a UFO that overlays the Space Invader, it appears normally, but colours go weird at overlap.

3 Spray up the Space Invader for the second time - at the same place - and it disappears, restoring the UFO in overlap zone.

Shapemaker for MODEL graphics on BBC

```
 100REM "Shapemaker for the BBC
 101S$="SFILE"
 102S%=&E00:BE%=&1800
 103*DISC
 104PROCasm
 105OSCLI("LOAD "+S$+" 3000")
 106*TAPE
 107!&70=&E003000:CALLMOOV
 108MODE7:!&CF8=&FFFFFFFF:!&CFC=&FFFFFF
FF:VDU23,253,&74,&44,&42,&61,&42,&44,&74
,0,23,254,&57,&52,&92,&92,&92,&52,&52,0
 109VDU23,249,&FF,&C0,&80,&80,&80,&80,&
80,&80,23,250,&FF,3,1,1,1,1,1,1,23,251,&
80,&80,&80,&80,&80,&80,&C0,&FF,23,252,1,
1,1,1,1,1,3,&FF,23,248,0,&3C,&7E,&7E,&7E
,&7E,&3C,0
 110PROCdotit("Grun's shape editor for
the BBC v3")
 130PRINT''CHR$134;TAB(8);"A) Create a
new shape"'';CHR$134;TAB(8)"B) Edit an o
ld shape"'';CHR$134;TAB(8)"C) Delete an
existing shape"'';CHR$134;TAB(8)"D) Save
 the Table"'';CHR$134;TAB(8)"E) Copy (&s
hift) a shape"'
 135PRINTCHR$134;TAB(8)"F) EOR two shap
es"
 140PRINTTAB(0,18);CHR$129;CHR$157;CHR$
131;"Please type the letter you need now
";
 150A=GET:IF(A<65)OR(A>70)THENVDU7:GOTO.
150
 155PROCscroll(19)
 160ONA-64GOTO200,400,600,800,300,360
 200PROCdotit("Create a new shape")
 210PROClin(CHR$129+"number of BYTES ac
ross:",1,8):IFER%THEN110 ELSE BA%=V%
 220PROClin(CHR$130+"number of LINES do
wn:",1,16):IFER%THEN110 ELSE LD%=V%
 230PROCmover(4):NOS%=NOS%+1:?S%=NOS%:I
FNOS%=1THEN270
 240FORY%=3TO0STEP-1:FORT%=NOS%-2 TO 0S
TEP-1
 250S%?(Y%*NOS%+1+T%)=(S%?(Y%*(NOS%-1)+
1+T%))
 260NEXT:NEXT
 270O%=O%+4:S%?(NOS%)=(O%MOD256):S%?(NO
S%*2)=(O%DIV256)-S%DIV256:S%?(NOS%*3)=BA
%:S%?(NOS%*4)=LD%
 280FORT%=O%TOO%+(BA%*LD%):?T%=0:NEXT:M
S%=NOS%-1:GOSUB852:GOTO450
 300PROCdotit("Copy and shift a shape")
:PROClin(CHR$131+"Which shape to copy",0
,NOS%-1):IFER%THEN110 ELSE OS%=V%
 310PROClin(CHR$131+"Horizontal Offset"
,-2,2):IFER%THEN110 ELSE DX%=V%
 315PROClin(CHR$130+"Vertical Offset",-
2,2):IFER%THEN110 ELSE DY%=V%
 320N1%=S%?(OS%+1)+256*(S%?(NOS%+OS%+1)
):B1%=S%?(NOS%*2+OS%+1):L1%=S%?(NOS%*3+O
S%+1)
 330GOSUB850:IF(BA%<B1%)OR(LD%<L1%)THEN
VDU7:MODE7:GOTO110
 335BI%=(B1%*2)-1:FORX%=0TOBI%:FORY%=0T
OL1%-1:IF((X%+DX%)<0)OR((X%+DX%)>BI%)OR(
(Y%+DY%)<0)OR((Y%+DY%)>(L1%-1))THEN350
 340PROCpread(N1%,X%,Y%,B1%):PROCcolour
(X%+DX%,Y%+DY%,A%):PROCupdate(X%+DX%,Y%+
DY%,A%)
 350NEXT:NEXT:GOTO450
 360PROCdotit("EOR two shapes"):PROClin
(CHR$131+"Shape one",0,NOS%-1):IFER%THEN
110 ELSE OS%=V%
 365N1%=S%?(OS%+1)+256*(S%?(NOS%+OS%+1)
):B1%=S%?(NOS%*2+OS%+1):L1%=S%?(NOS%*3+O
S%+1):GOSUB850:FORT%=0TO(B1%*L1%)-1:U%=(
S%?(N%+T%)):U%=U% EOR (S%?(N1%+T%)):S%?(
N%+T%)=U%:NEXT
 370MODE7:GOTO110
 400PROCdotit("Edit an old shape")
 410GOSUB850
 450C%=7:PROCc:X%=19-(ADVAL(1)DIV3280):
Y%=31-(ADVAL(2)DIV2040)
 460H%=(ADVAL(1)DIV410):O%=(ADVAL(2)DIV
255):IF((H%AND7)>1)AND((H%AND7)<7)THENX%
=19-(H%DIV8)
 462IF((O%AND7)>1)AND((O%AND7)<7)THENY%
=31-(O%DIV8)
 463IFY%>19THENY%=21
 464PRINTTAB(X%,Y%);:IF(ADVAL(0)AND3)=0
THEN460
 470IFY%<>21THEN500
 480IFX%<16THENC%=X%:PROCc:GOTO460
 490IF(X%=17)OR(X%=18)THENMODE7:GOTO110
 500IF(X%<4)OR(X%>(4+BA%*2-1))THEN460
 510IF(Y%<1)OR(Y%>LD%)THEN460
 520PROCcolour(X%-4,Y%-1,C%):PROCupdate
(X%-4,Y%-1,C%):GOTO460
 600PROCdotit("Delete a shape")
 610GOSUB850:PRINTTAB(3,25);"Delete (Y/
N)":A=GET:IFA<>ASC("Y")THENMODE7:GOTO110
 615FORY%=0TO3
 630Z%=0:FORT%=0TONOS%-1:IFT%=MS%THEN65
0
 640S%?(Y%*(NOS%-1)+1+Z%)=S%?((Y%*NOS%)
+1+T%):Z%=Z%+1
 650NEXT
 660NEXTY%
 665NOS%=NOS%-1:?S%=NOS%:W%=S%+1+4*NOS%
:FORT%=W%+4 TO O%:IF(T%>=(N%+S%))AND(T%<
(N%+S%+BA%*LD%))THEN667
 666?W%=?T%:W%=W%+1
 667NEXT
 680FORT%=0TONOS%-1:G%=S%?(1+T%)+256*(S
%?(NOS%+1+T%))-4:IFT%>=MS%THENG%=G%-(BA%
*LD%)
 681S%?(T%+1)=G% MOD256:S%?(NOS%+1+T%)=
G% DIV256:NEXT
 700MODE7:GOTO110
 800!&70=&30000E00:CALLMOOV
 810*DISC
 815R%=(256*(S%?(NOS%*2))+(S%?NOS%))+(S
%?(NOS%*3))*(S%?(NOS%*4))+&3000:VDU30:PR
INT;~R%
 820OSCLI("SAVE "+S$+" 3000 "+CHR$?&7CC
B+CHR$?&7CC9+CHR$?&7CCA+CHR$?&7CCB)
 825*TAPE
 830!&70=&0E003000:CALLMOOV
 840MODE7:GOTO110
 850PROClin(CHR$131+"Which shape to edi
t",0,NOS%-1):IFER%THEN110 ELSE MS%=V%
 852MODE2:N%=S%?(MS%+1)+256*(S%?(NOS%+M
S%+1)):BA%=S%?(NOS%*2+MS%+1):LD%=S%?(NOS
%*3+MS%+1):FORX%=0TO(BA%*2)-1:PRINTTAB(4
+X%,0);X%MOD10;:NEXT:FORY%=0TOLD%-1:PRIN
TTAB(3,Y%+1);Y%MOD10;:NEXT
 854FORY%=0TOLD%-1:FORX%=0TO(BA%*2)-1ST
EP2:C%=S%?(N%+(Y%*BA%)+(X%DIV2)):B%=(C%A
ND&AA)DIV2:GOSUB980:PROCcolour(X%,Y%,A%)
:B%=C%AND&55:GOSUB980:PROCcolour(X%+1,Y%
,A%)
 856NEXT:NEXT:FORT%=0TO15:COLOURT%:COLO
UR132
 857PRINTTAB(T%,21);CHR$248;:NEXT:COLOU
R7:COLOUR128:VDU32,253,254:ER%=0:PRINTTA
B(0,30);"SHAPE: ";MS%:RETURN
 900DEFPROCdotit(A$):VDU26:PRINTTAB(4,0
);SPC(35);TAB(4,1);SPC(35):T%=((40-LEN(A
$))/2)+1:PRINTTAB(0,0);CHR$(131);CHR$157
;CHR$132;CHR$141;TAB(T%);A$';CHR$(131);C
HR$157;CHR$132;CHR$141;TAB(T%);A$
 905NOS%=?S%:PRINTTAB(0,3);NOS%;" Shape
";:IFNOS%<>1THENPRINT"s";
 906IFNOS%<>0THENPRINT" (0-";NOS%-1;")"
;
 907PRINTTAB(29);:PROCfend:PRINT;INT(10
0-((O%-S%-1)/(BE%-S%)*100));" % free ":V
DU28,0,23,39,5:ENDPROC
 910DEFPROCfend:IFNOS%=0THENO%=S%+1:END
PROC ELSE O%=S%+((S%?(NOS%))+256*(S%?(NO
S%*2)))+(S%?(NOS%*3))*(S%?(NOS%*4)):ENDP
ROC
 920DEFPROCscroll(A%):FORT%=0TOA%:PRINT
TAB(0,18):OSCLI("FX19"):NEXT:ENDPROC
 930DEFPROCmover(A%):FORT%=O% TO S%+(4*
NOS%)+1 STEP-1
 940T%?A%=(?T%):NEXT:FORT%=0TONOS%-1:B%
=(S%?(T%+1))+256*(S%?(NOS%+T%+1))+A%:S%?
(T%+1)=(B% MOD256):S%?(NOS%+T%+1)=(B% DI
V256):NEXT:ENDPROC
 950DEFPROCcolour(X1%,Y1%,C1%):COLOURC1
%:PRINTTAB(X1%+4,Y1%+1);CHR$255;CHR$8;:G
COL0,C1%:PLOT69,X1%*8,1023-(Y1%*4):ENDPR
OC
 960DEFPROCupdate(X1%,Y1%,C1%):A%=(C1%A
ND8)*8+(C1%AND4)*4+(C1%AND2)*2+(C1%AND1)
:MA%=&AA:IF (X1%AND1)=0THENA%=A%*2:MA%=&
55
 970O%=N%+(Y1%*BA%)+X1%DIV2:B%=S%?O%:S%
?O%=((B% AND MA%)OR A%):ENDPROC
 980A%=(B%AND64)DIV8+(B%AND16)DIV4+(B%A
ND4)DIV2+(B%AND1):RETURN
 990DEFPROCc:COLOUR128+C%:IFC%<>4THENCO
LOUR4ELSECOLOUR7
 995PRINTTAB(0,3);CHR$249;CHR$250;TAB(0
,4);CHR$251;CHR$252:COLOUR128:ENDPROC
 1000DEFPROCasm:FORT%=0TO2STEP2:P%=&C00:
[OPTT%:.MOOV LDY#0:.M1 LDA(&70),Y:STA(&7
2),Y:INY:BNEM1:INC&71:INC&73:LDA&71:CMP#
&18:BEQP%+8:LDA&73:CMP#&18:BNEM1:RTS:]:N
EXT:ENDPROC
 1010DEFPROClin(A$,R%,E%):PRINTTAB(0,3);
SPC(40);TAB(0,3);CHR$130;A$;CHR$135;:INP
UT"",A$:V%=EVAL(A$):IF(V%<R%)OR(V%>E%)TH
ENVDU7:PROCscroll(5):ER%=1:ENDPROC ELSE
ER%=0:ENDPROC
 1020DEFPROCpread(R%,W%,T%,M%):C%=S%?(R%
+(T%*M%)+(W%DIV2)):B%=(C%AND&AA)DIV2:IF(
W%AND1)THENB%=C%AND&55
 1030GOSUB980:ENDPROC
```

MSHAPE Program to Run on BBC

```
 10REM MSHAPE
 30X=&70:Y=&71:S=&72:TA=&74:TEMP=&76:T
EMP1=&77:TEMP2=&78:TEMP3=&79:TEMP4=&7A:T
EMP5=&7B:old=&7C:BASAC=&7D:EXIT=&7E
 100[OPTY%:JMPINIT:]
 110L32=P%:FORT%=0TO31:A%=&3000+(&280*T
%):!O%=A%:P%=P%+2:O%=O%+2:NEXT
 115SF=P%:VDU30:PRINT;~O%:OSCLI("LOAD S
FILE "+CHR$?&7C00+CHR$?&7C01+CHR$?&7C02+
CHR$?&7C03):L=?O%:LOTAB=P%+1:HOTAB=P%+L+
1:BA=P%+2*L+1:LD=P%+3*L+1:Q%=(O%?L)+256*
(O%?(L*2))+((O%?(L*3))*(O%?(L*4))):P%=P%
+Q%:O%=O%+Q%
 120[OPTY%:.FPOS LDAY:LSRA:LSRA:AND#&FE
:TAX:LDAL32+1,X:STAS+1:LDAL32,X:STAS:LDA
 X:AND#&FE:ASLA:BCCFP1:INCS+1:INCS+1:.FP
1 ASLA:BCCFP2:INCS+1:.FP2 CLC:ADCS:STAS:
BCCP%+4:INCS+1:RTS
 130.SDO PHP:SEI:STATEMP:TXA:PHA:TYA:PH
A:JSRFPOS:LDXTEMP:LDAHOTAB,X:CLC:ADC#(SF
 DIV256):STATA+1:LDALOTAB,X:CLC:ADC#(SF
MOD256):STATA:BCCP%+4:INCTA+1:LDABA,X:SE
C:SBC#1:STATEMP:STATEMP5:LDALD,X:STATEMP
1:LDAY:AND#7:STATEMP3:LDA#0:STATEMP2
 135STATEMP4:STAold:LDAX:AND#1:TAX
 140.SD1 LDYTEMP2:LDA(TA),Y:PHA:CPX#0:B
EQSD2:AND#&AA:LSRA:ORAold:.SD2 INCTEMP2:
LDYTEMP3:EOR(S),Y:STA(S),Y:PLA:AND#&55:A
SLA:STAold:TYA:CLC:ADC#8:STATEMP3:DECTEM
P5:BPLSD1:TAY:CPX#0:BEQSD3:LDAold:AND#&A
A:EOR(S),Y:STA(S),Y:.SD3
 150LDA#0:STAold:DECTEMP1:BEQFIN:LDATEM
P:STATEMP5:INCTEMP4:LDAY:CLC:ADCTEMP4:AN
D#7:STATEMP3:BNESD1
 160INCS+1:INCS+1:LDAS:CLC:ADC#&80:STAS
:BCCP%+4:INCS+1:JMPSD1
 170.FIN PLA:TAY:PLA:TAX:PLP:RTS
 180.INIT LDA#72:STABASAC:LDA#0:STAEXIT
:LDA#22:JSR&FFEE:LDA#2:JSR&FFEE:LDA#0:JS
RDBAS
 400.GAMLOOP JSRBMOVE
 460LDA#19:JSR&FFF4:LDAEXIT:BEQGAMLOOP:
RTS
 480\
 490\"Test for the SDO routine follows:
 press caps lock to make shape move lef
t, CTRL to move right
 495\
 500.BMOVE LDX#&BF:LDY#&FF:LDA#&81:JSR&
FFF4:CPY#&FF:BNETRHT
 510LDABASAC:CMP#1:BCCLEAVE:LDA#1:DECBA
SAC:DECBASAC:JMPDBAS
 520.TRHT LDX#&FE:LDY#&FF:LDA#&81:JSR&F
FF4:CPY#&FF:BNELEAVE:LDABASAC:CMP#145:BC
SLEAVE:LDA#1:JSRDBAS:INCBASAC:INCBASAC:.
LEAVE RTS
 530.DBAS PHA:LDABASAC:STAX:LDA#240:STA
Y:PLA:JMPSDO
 9999]:PAGE=&1900:GOTO90
30000MODE7:B$="":INPUT"Save Mshape? : "
A$:IFA$<>"Y"THENSTOP ELSE PRINTCHR$30;~P
AGE;~TOP:FORY%=0TO7:B$=B$+CHR$(Y%?&7C00)
:NEXT:OSCLI("SAVE MSHAPE "+LEFT$(B$,4)+"
 "+RIGHT$(B$,4))
```

Line 30 sets up labels.
Line 110: start of first character cell on each line.
120 converts (x,y) co-ordinates to a screen address in S and S+1

Continued on page 83

GRAFPAD

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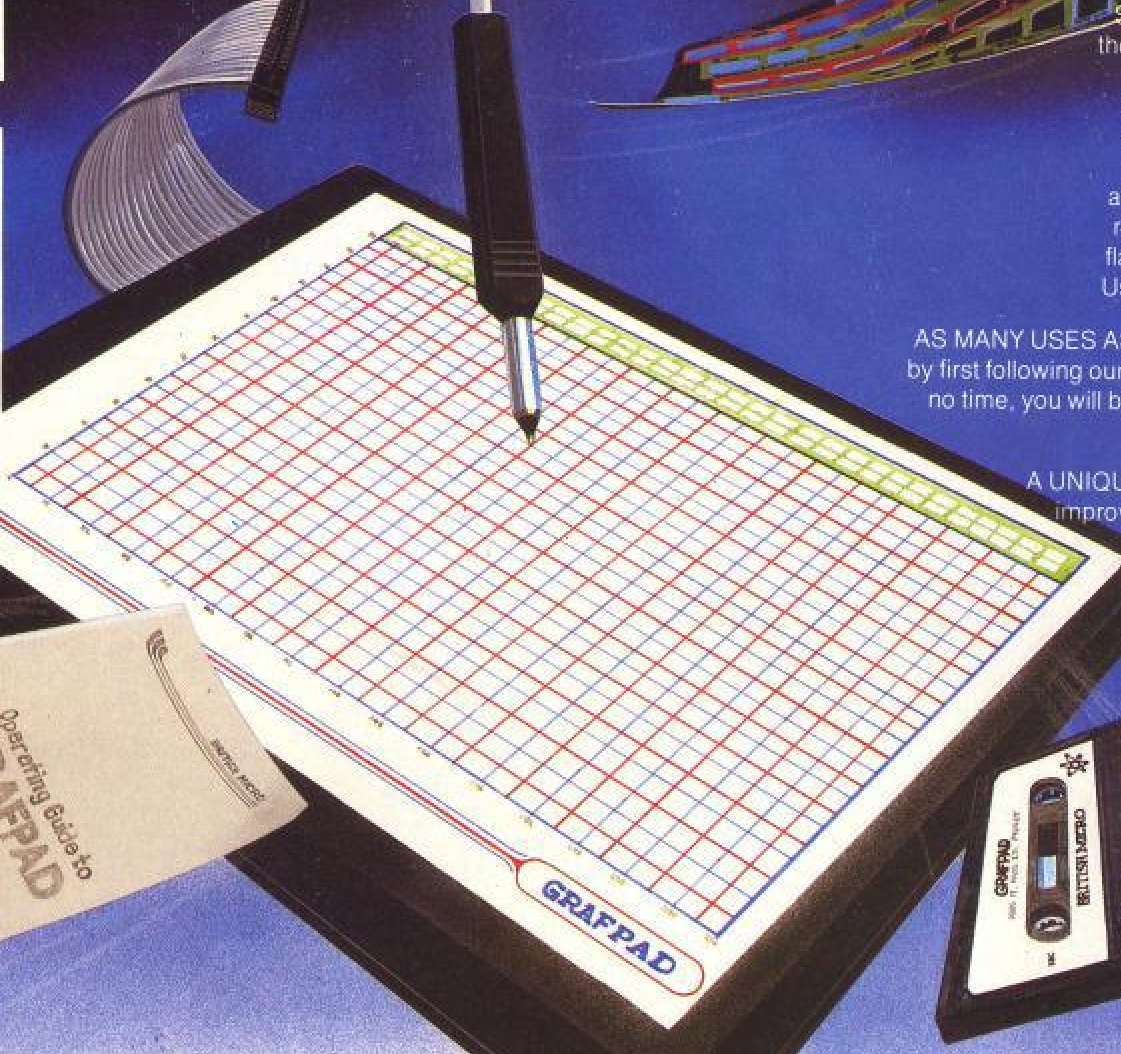
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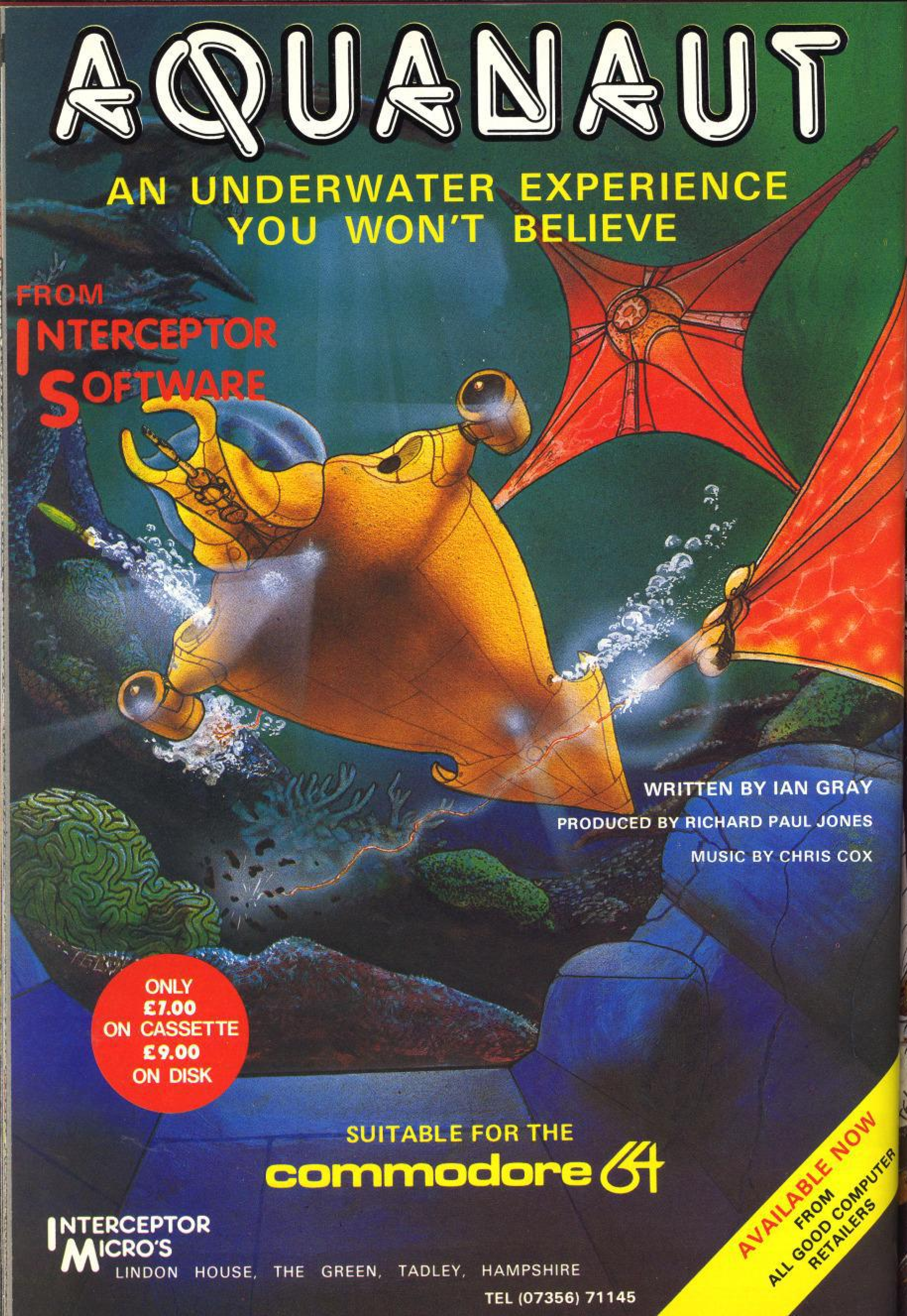
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Shapemaker for ORIC graphics (Runs on BBC)

```
 100REM "Shapemaker for the ORIC
 101S$="SFILE"
 102S%=&E00:BE%=&1800
 103*DISC
 104PROCasm
 105?&3000=0:OSCLI("LOAD "+S$+" 3000")
 106*TAPE
 107!&70=&E003000:CALLMOOV
 108MODE7:!&CF8=&FFFFFFFF:!&CFC=&FFFFFF
FF:VDU23,253,&74,&44,&42,&61,&42,&44,&74
,0,23,254,&57,&52,&92,&92,&92,&52,&52,0
 109VDU23,249,&FF,&C0,&80,&80,&80,&80,&
80,&80,23,250,&FF,3,1,1,1,1,1,1,23,251,&
80,&80,&80,&80,&80,&80,&C0,&FF,23,252,1,
1,1,1,1,1,3,&FF,23,248,0,&3C,&7E,&7E,&7E
,&7E,&3C,0
 110PROCdotit("Grun's shape editor for
the BBC v3")
 130PRINT''CHR$134;TAB(8);"A) Create a
new shape"'';CHR$134;TAB(8)"B) Edit an o
ld shape"'';CHR$134;TAB(8)"C) Delete an
existing shape"'';CHR$134;TAB(8)"D) Save
 the Table"'';CHR$134;TAB(8)"E) Copy (&s
hift) a shape"'
 135PRINTCHR$134;TAB(8)"F) EOR two shap
es"
 140PRINTTAB(0,18);CHR$129;CHR$157;CHR$
131;"Please type the letter you need now
";
 150A=GET:IF(A<65)OR(A>70)THENVDU7:GOTO
150
 155PROCscroll(19)
 160ONA-64GOTO200,400,600,800,300,360
 200PROCdotit("Create a new shape")
 210PROClin(CHR$129+"number of BYTES ac
ross:",1,8):IFER%THEN110 ELSE BA%=V%
 220PROClin(CHR$130+"number of LINES do
wn:",1,16):IFER%THEN110 ELSE LD%=V%
 230PROCmover(4):NOS%=NOS%+1:?S%=NOS%:I
FNOS%=1THEN270
 240FORY%=3TO0STEP-1:FORT%=NOS%-2 TO 0S
TEP-1
 250S%?(Y%*NOS%+1+T%)=(S%?(Y%*(NOS%-1)+
1+T%))
 260NEXT:NEXT
 270O%=O%+4:S%?(NOS%)=(O%MOD256):S%?(NO
S%*2)=(O%DIV256)-S%DIV256:S%?(NOS%*3)=BA
%:S%?(NOS%*4)=LD%
 280FORT%=O%TOO%+(BA%*LD%):?T%=64:NEXT:
MS%=NOS%-1:GOSUB852:GOTO450
 300PROCdotit("Copy and shift a shape")
:PROClin(CHR$131+"Which shape to copy",0
,NOS%-1):IFER%THEN110 ELSE OS%=V%
 310PROClin(CHR$131+"Horizontal Offset"
,-2,2):IFER%THEN110 ELSE DX%=V%
 315PROClin(CHR$130+"Vertical Offset",-
2,2):IFER%THEN110 ELSE DY%=V%
 320N1%=S%?(OS%+1)+256*(S%?(NOS%+OS%+1)
):B1%=S%?(NOS%*2+OS%+1):L1%=S%?(NOS%*3+O
S%+1)
 330GOSUB850:IF(BA%<B1%)OR(LD%<L1%)THEN
VDU7:MODE7:GOTO110
 335B1%=(B1%*6)-1:FORX%=0TOB1%:FORY%=0T
OL1%-1:IF((X%+DX%)<0)OR((X%+DX%)>B1%)OR(
(Y%+DY%)<0)OR((Y%+DY%)>(L1%-1))THEN350
 340PROCpread(N1%,X%,Y%,B1%):PROCcolour
(X%+DX%,Y%+DY%,A%):PROCupdate(X%+DX%,Y%+
DY%,A%)
 350NEXT:NEXT:GOTO450
 360PROCdotit("EOR two shapes"):PROClin
(CHR$131+"Shape one",0,NOS%-1):IFER%THEN
110 ELSE OS%=V%
 365N1%=S%?(OS%+1)+256*(S%?(NOS%+OS%+1)
):B1%=S%?(NOS%*2+OS%+1):L1%=S%?(NOS%*3+O
S%+1):GOSUB850:FORT%=0TO(B1%*L1%)-1:U%=(
S%?(N%+T%)):U%=U% EOR (S%?(N1%+T%)):S%?(
N%+T%)=U%:NEXT
 370MODE7:GOTO110
 400PROCdotit("Edit an old shape")
 410GOSUB850
 450off%=1:X%=79-(ADVAL(1)DIV820):Y%=31
-(ADVAL(2)DIV2040)
 460H%=(ADVAL(1)DIV102):O%=(ADVAL(2)DIV
255):IF((H%AND7)>1)AND((H%AND7)<7)THENX%
=79-(H%DIV8)
 462IF((O%AND7)>1)AND((O%AND7)<7)THENY%
=31-(O%DIV8)
 463IFY%>19THENY%=21
 464PRINTTAB(X%,Y%);:IF(ADVAL(0)AND3)=0
THENoff%=1:GOTO460
 465IFoff%=0THEN460ELSEoff%=0
 490IF(Y%=21)AND((X%=17)OR(X%=18))THENM
ODE7:GOTO110
 500IF(X%<7)OR(X%>(7+BA%*6-1))THEN460
 510IF(Y%<1)OR(Y%>LD%)THEN460
 520PROCpread(N%,X%-7,Y%-1,BA%):A%=A%EO
R1:PROCcolour(X%-7,Y%-1,A%):PROCupdate(X
%-7,Y%-1,A%):GOTO460
 600PROCdotit("Delete a shape")
 610GOSUB850:PRINTTAB(3,25);"Delete (Y/
N)":A=GET:IFA<>ASC("Y")THENMODE7:GOTO110
 615FORY%=0TO3
 630Z%=0:FORT%=0TONOS%-1:IFT%=MS%THEN65
0
 640S%?(Y%*(NOS%-1)+1+Z%)=S%?((Y%*NOS%)
+1+T%):Z%=Z%+1
 650NEXT
 660NEXTY%
 665NOS%=NOS%-1:?S%=NOS%:W%=S%+1+4*NOS%
:FORT%=W%+4 TO O%:IF(T%>=(N%+S%))AND(T%<
(N%+S%+BA%*LD%))THEN667
 666?W%=?T%:W%=W%+1
 667NEXT
 680FORT%=0TONOS%-1:G%=S%?(1+T%)+256*(S
%?(NOS%+1+T%))-4:IFT%>=MS%THENG%=G%-(BA%
*LD%)
 681S%?(T%+1)=G% MOD256:S%?(NOS%+1+T%)=
G% DIV256:NEXT
 700MODE7:GOTO110
 800!&70=&30000E00:CALLMOOV
 810*DISC
 815R%=(256*(S%?(NOS%*2))+(S%?NOS%))+(S
%?(NOS%*3))*(S%?(NOS%*4))+&3000:VDU30:PR
INT;~R%
 820OSCLI("SAVE "+S$+" 3000 "+CHR$?&7CC
8+CHR$?&7CC9+CHR$?&7CCA+CHR$?&7CCB)
 825*TAPE
 830!&70=&0E003000:CALLMOOV
 840MODE7:GOTO110
 850PROClin(CHR$131+"Which shape to edi
t",0,NOS%-1):IFER%THEN110 ELSE MS%=V%
 852MODE0:N%=S%?(MS%+1)+256*(S%?(NOS%+M
S%+1)):BA%=S%?(NOS%*2+MS%+1):LD%=S%?(NOS
%*3+MS%+1):FORX%=0TO(BA%*6)-1:PRINTTAB(7
+X%,0);X%MOD10;:NEXT:FORY%=0TOLD%-1:PRIN
TTAB(6,Y%+1);Y%MOD10;:NEXT
 854FORY%=0TOLD%-1:FORX%=0TO(BA%*6)-1ST
EP6:C%=S%?(N%+(Y%*BA%)+(X%DIV6)):V%=0:T%
=32:REPEAT:B%=-((C% ANDT%)<>0):PROCcolou
r(X%+V%,Y%,B%):T%=T%-(T%/2):V%=V%+1:UNTI
LT%<1
 856NEXT:NEXT:COLOUR1:PRINTTAB(17,21);:
VDU253,254:ER%=0:PRINTTAB(0,30);"SHAPE:
";MS%:RETURN
 857PRINTTAB(T%,21);CHR$248;:NEXT:COLOU
R7:COLOUR128:VDU32,253,254:ER%=0:PRINTTA
B(0,30);"SHAPE: ";MS%:RETURN
 900DEFPROCdotit(A$):VDU26:PRINTTAB(4,0
);SPC(35);TAB(4,1);SPC(35):T%=((40-LEN(A
$))/2)+1:PRINTTAB(0,0);CHR$(131);CHR$157
;CHR$132;CHR$141;TAB(T%);A$';CHR$(131);C
HR$157;CHR$132;CHR$141;TAB(T%);A$
 905NOS%=?S%:PRINTTAB(0,3);NOS%;" Shape
";:IFNOS%<>1THENPRINT"s";
 906IFNOS%<>0THENPRINT" (0-";NOS%-1;")"
;
 907PRINTTAB(29);:PROCfend:PRINT;INT(10
0-((O%-S%-1)/(BE%-S%)*100));" % free ":V
DU28,0,23,39,5:ENDPROC
 910DEFPROCfend:IFNOS%=0THENO%=S%+1:END
PROC ELSE O%=S%+((S%?(NOS%))+256*(S%?(NO
S%*2)))+(S%?(NOS%*3))*(S%?(NOS%*4)):ENDP
ROC
 920DEFPROCscroll(A%):FORT%=0TOA%:PRINT
TAB(0,18):OSCLI("FX19"):NEXT:ENDPROC
 930DEFPROCmover(A%):FORT%=O% TO S%+(4*
NOS%)+1 STEP-1
 940T%?A%=(?T%):NEXT:FORT%=0TONOS%-1:B%
=(S%?(T%+1))+256*(S%?(NOS%+T%+1))+A%:S%?
(T%+1)=(B% MOD256):S%?(NOS%+T%+1)=(B% DI
V256):NEXT:ENDPROC
 950DEFPROCcolour(X1%,Y1%,C1%):COLOURC1
%:PRINTTAB(X1%+7,Y1%+1);CHR$255;CHR$8;:G
COL0,C1%:PLOT69,X1%*2,1023-(Y1%*4):ENDPR
OC
 960DEFPROCupdate(X1%,Y1%,C1%):A%=2^(5-
(X1%MOD6)):C1%=C1%AND1
 970O%=N%+(Y1%*BA%)+X1%DIV6:I%=(S%?O%)A
ND (A%EOR63):S%?O%=((I% OR (A%*C1%))OR64
):ENDPROC
 1000DEFPROCasm:FORT%=0TO2STEP2:P%=&C00:
[OPTT%:.MOOV LDY#0:.M1 LDA(&70),Y:STA(&7
2),Y:INY:BNEM1:INC&71:INC&73:LDA&71:CMP#
&18:BEQP%+8:LDA&73:CMP#&18:BNEM1:RTS:]:N
EXT:ENDPROC
 1010DEFPROClin(A$,R%,E%):PRINTTAB(0,3);
SPC(40);TAB(0,3);CHR$130;A$;CHR$135;:INP
UT"",A$:V%=EVAL(A$):IF(V%<R%)OR(V%>E%)TH
ENVDU7:PROCscroll(5):ER%=1:ENDPROC ELSE
ER%=0:ENDPROC
 1020DEFPROCpread(R%,W%,T%,M%):C%=S%?(R%
+(T%*M%)+(W%DIV6)):B%=2^(5-(W%MOD6)):A%=
((C%ANDB%)<>0)AND1:ENDPROC
```

MSHAPE Program to Run on ORIC

```
 10REM MSHAPE
 30X=0:Y=1:S=2:TA=4:fine=6:TEMP=7:TEMP
1=8:TEMP2=9:TEMP3=10:TEMP4=11:TEMP5=12:B
ASAC=13:old=14:old1=15:mask=16:EXIT=17:M
ASK1=70:old2=71
 100[OPTY%:JMPINIT:]
 110L199=P%:FORT%=0TO199:A%=&A000+(40*T
%):!O%=A%:P%=P%+2:O%=O%+2:NEXT
 112L6=P%:FORT%=0TO39:A%=T%*6:?O%=A%:P%
=P%+1:O%=O%+1:NEXT
 115SF=P%:VDU30:PRINT;~O%:OSCLI("LOAD S
FILE "+CHR$?&7C00+CHR$?&7C01+CHR$?&7C02+
CHR$?&7C03):L=?O%:LOTAB=P%+1:HOTAB=P%+L+
1:BA=P%+2*L+1:LD=P%+3*L+1:O%=(O%?L)+256*
(O%?(L*2))+((O%?(L*3))*(O%?(L*4))):P%=P%
+O%:O%=O%+O%
 116POIN=P%:P%=P%+L*10:O%=O%+L*10
 120[OPTY%:.FPOS LDAY:ASLA:TAY:LDAL199,
Y:STAS:LDAL199+1,Y:STAS+1:LDY#0:LDAX:.FP
1 INY:CMPL6,Y:BEQFP2:BCSFP1:DEY:.FP2 TYA
:CLC:ADCS:STAS:BCCP%+4:INCS+1:LDAX:SEC:S
BCL6,Y:STAfine:TAX:LDAbin,X:STAmask:RTS
 130.SDO PHP:SEI:STATEMP:TXA:PHA:TYA:PH
A:JSRFPOS:LDXTEMP:LDAHOTAB,X:CLC:ADC#(SF
DIV256):STATA+1:LDALOTAB,X:CLC:ADC#(SF
MOD256):STATA:BCCP%+4:INCTA+1:LDABA,X:ST
ATEMP:LDALD,X:STATEMP2:LDA#0:STATEMP5
 135.NLINE LDA#0:STAold:STATEMP3:STATEM
P4:LDATEMP:STATEMP1:STAold2
 140.SD1 LDYTEMP5:INCTEMP5:LDA#128:STAM
ASK1:LDA(TA),Y:LDXfine
 145BEQSD3:.SD2 ASLold:BCCP%+5:ORA#64:B
IT&BF29:LSRA:PHP:RORold2:PLP:TAY:BCCP%+5
:LDAMASK1:BIT&1A9:ORAold1:STAold1:TYA:LS
RMASK1:DEX:BNESD2:.SD3
 150LDYTEMP4:INCTEMP4:EOR(S),Y:ORA#64:S
TA(S),Y:LDAold1:STAold:LDA#0:STAold1:DEC
TEMP1:BNESD1:LDAfine:BEQSD4:LDAold2:LSRA
:LSRA:ANDmask:BEQSD4:INY:EOR(S),Y:ORA#64
:STA(S),Y:.SD4 LDA#0:STAold2
 155LDAS:CLC:ADC#40:STAS:BCCP%+4:INCS+1
:DECTEMP2:BNENLINE
 170.FIN PLA:TAY:PLA:TAX:PLP:RTS
 180.INIT LDA#0:STAX:LDA#20:STAY:LDA#0:
JSRSDO:.IOU LDY#0:LDX#80:.IOP INY:BNEIOP
:DEX:BNEIOP:LDAX:CMP#200:BNEP%+3:RTS:LDA
#1:JSRSDO:INCX:JMPIOU
 190.bin EQUB0:EQUB&20:EQUB&30:EQUB&38:
EQUB&3C:EQUB&3E
 9999]:PAGE=&1900:GOTO90
30000MODE7:B$="":INPUT"Save Mshape? : "
A$:IFA$<>"Y"THENSTOP ELSE PRINTCHR$30;~P
AGE;~TOP:FORY%=0TO7:B$=B$+CHR$(Y%?&7C00)
:NEXT:OSCLI("SAVE MSHAPE "+LEFT$(B$,4)+"
 "+RIGHT$(B$,4))
```

Line 30 sets up the labels. 100: JMP to init at &600. 110: table of addresses for start of scan line. 112: table of pixels/byte on a horizontal line. 115 loads in the shapefile. 120: routine to convert x,y co-ords in a screen address in S and SH. 130: sgape DO routine; save x and y, call FPOS and find position in the shape table. 135 resets counter. 140 draws that line. 155 moves to next line. 170:return, retrieving x and y first. 180 tests routine,moves a shape slowly to the right.

Art for A(r)tari's Sake...

You don't have to amputate an auricle to get next to some of the best graphics around. NIGEL FARRIER lays down the lowdown . . .

OVER THE next few months I hope to take you through some of the various aspects of the graphics capabilities of the Atari. Those of you who are fortunate enough to own one of the new XL range will not have to pay too much attention to display lists and Antic modes as they are easily available on your machines. Most of these articles are aimed at the owners of the old faithfuls, the Atari 400 and 800.

THE GRAPHICS MACHINE

Because of its games playing background the Atari machine has been geared to creating some phenomenal graphics effects wtih multicoloured player/missiles, high resolution graphics and scrolling in every direction.

Although this is normally done by machine code for speed, even the beginner can create some very good visual effects on the screen from Basic. The first decision to make is what GRAPHICS mode you are going to use.

If you are going to have text on the screen then you would probably be using one of the three text screens, ie GRAPHICS Ø, 1, or 2. If not then you will be using one of the graphics modes from 3 to 11 (15 if you have an XL). Each of these modes has a different resolution and a different number of colours and luminosities (the brightness level) that are normally available to you.

Figure 1 is a table which gives the different resolutions etc. for each of the Graphics modes. I have also included the amount of RAM used in bytes for each mode as this may be important when designing a program to fit into, say, 16K.

In the fourth column you will see that there are two possible configurations for columns x rows. The upper figure, if there is one, is for the graphics screen with a text window and the bottom for no text window.

In the graphics modes which do have a test window you can get rid of it by adding +16 to the graphics mode when entering the command. For instance, should you require an entire screen of GRAPHICS 8 without the text window at the bottom you would enter

GRAPHICS 8+16

or more simply

GRAPHICS 24

which has exactly the same effect.

PLOT and DRAWTO

In order to get something to appear on the graphics screen you are going to have to use the terms PLOT and DRAWTO. These terms are self explanatory. The PLOT statement will plot a point on the screen at the given coordinates. DRAWTO will draw from a given point to another. These commands take the form

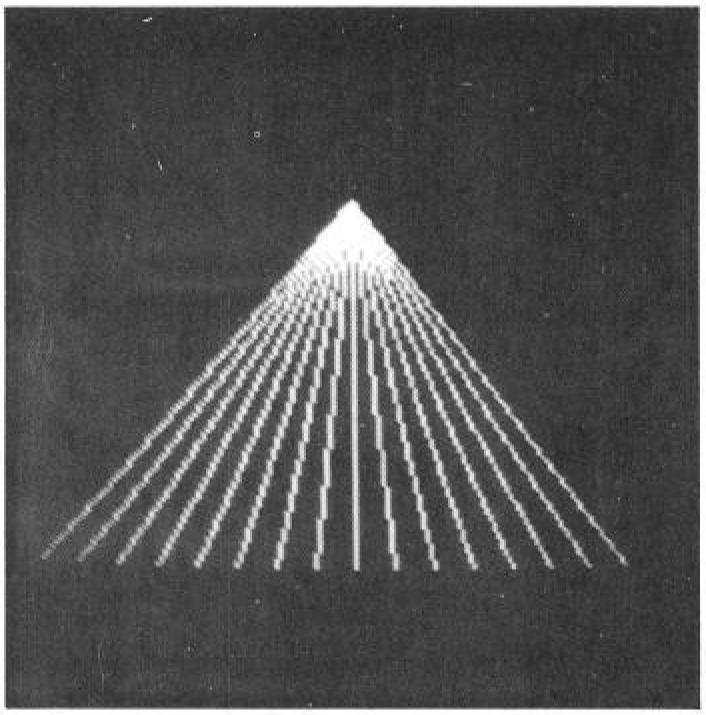
PLOT X, Y

and

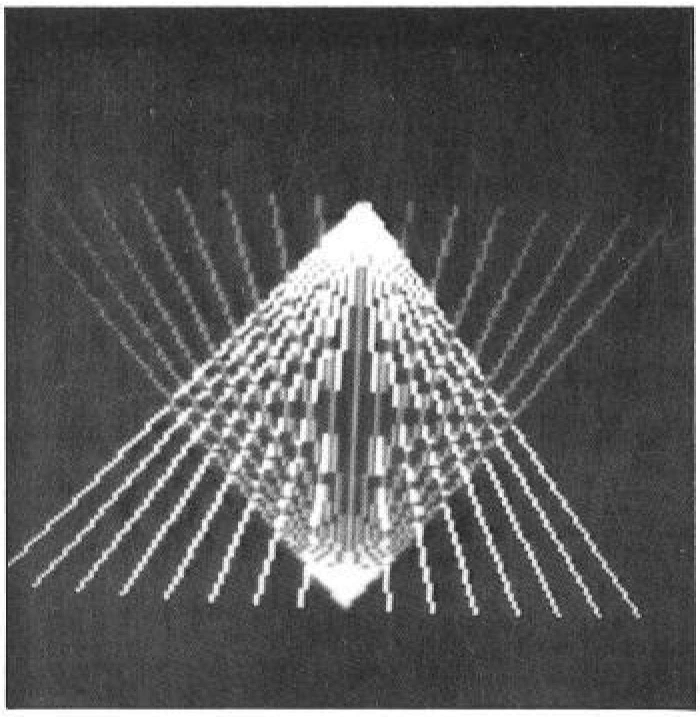
DRAWTO X1, Y1

X and Y are the coordinates on the screen. Be careful that the computer does not try to PLOT or DRAWTO outside of its normal limits otherwise your program will stop and an error message will appear.

DRAWTO will draw to points X1 and Y1 from the previously PLOTted point or the last point that was drawn to. This command actually draws a physical line on the screen. Try the following little program and try to see what each command is doing.



The result of lines 10-60 . . .



. . . add 60-110 to achieve this. Clever, huh?



```
10 GRAPHICS 7+16
15 COLOR 1
20FOR X=0 TO 159 STEP 10
30 PLOT 80,0
40 DRAWTO X,95
50 NEXT X
60 GOTO 60
```

SETCOLOR and COLOR

In the above example the colour that was drawn on the screen was what is known as the default colour. You can choose between 256 possible colours (that is, 16 colours at 16 different luminosities). The colours are selected using the SETCOLOR statement. The COLOR (sorry about the spelling but you know what these Americans are like) statement allows you to choose which one you are going to PLOT or DRAWTO with.

In line 15 above there appears a COLOR statement. Before going any further what happens if you change this number to say 2 or 3? If you change it to COLOR 4 then you are now drawing in the background colour (black) and you will not see anything. There are three colours that you can draw with in GRAPHICS 7 without any SETCOLOR statement — orange, green and blue. But what if you do not want these particular colours?

Let us suppose that you want to draw with a fairly bright red colour. You would then have to change the colour registers with the SETCOLOR statement which takes the form

SETCOLOR reg, col, lum

where *reg* is the number of the colour register, *col* is the colour number and *lum* its brightness number. This latter number is usually an even number from 0 to 14, 0 being dark and 14 being light. The colour number is a number from 0 to 15 and this chooses the colour as in figure 2.

FIGURE 2:

0 — Grey	8 — Blue
1 — Gold	9 — Light Blue
2 — Orange	10 — Turquoise
3 — Red-orange	11 — Green-blue
4 — Pink	12 — Green
5 — Pink-purple	3 — Yellow-green
6 — Purple-blue	14 — Orange-green
7 — Blue	15 — Light-Orange

The colour register number is usually a number from 0 to 4. Unfortunately these numbers do not correspond exactly with the numbers used in the COLOR statement! Just to be confusing you normally have to add 1 to the colour register number to get the number you would use for the COLOR statement.

Now let's change the colour from that awful orange to an equally awful bright pink in our little program above by adding the following line

```
12 SETCOLOR 0,3,10
```

Try out different values for the SETCOLOR and the COLOR statements to see what effects they have on the screen. For instance what does SETCOLOR 4,1,4 do to the background? You might also like to add the following to create a pattern on the screen.

```
60 SETCOLOR 1,1,4
65 COLOR 2
70 FOR X=0 TO 159 STEP 10
80 PLOT 80,95
90 DRAWTO X,0
100 NEXT X
110 GOTO 110
```

TEXT ON ANY SCREEN

If one normally wants to have text on one of the graphics screens you would put it into the text window at the bottom. Sometimes this does not create the desired effect. My thanks go to Alan Wood for the following program which will put text onto the screen in any of the graphics modes 3 to 8. I have adapted it slightly so that it is now a subroutine that you can use in your programs.

All the program does is to use the PLOT command to create the letters on the screen. As it stands it will only cope with capital letters. You can adapt it by altering the 32 in line 29020. Line 28999 onwards is the actual subroutine, the program before that is just to demonstrate what it can do. Error checking I am afraid is left up to the programmer.

You have to pass over to the routine the text in A$, HPOS and VPOS as the starting coordinates for plotting, and the correct COLOR in variable C.

```
10 REM TEXT IN ANY
GRAPHICS MODE
20 REM ***** BY ALAN WOOD
30 GRAPHICS 5:C=1
40 DIM A$(20):A$="ANY TEXT"
50 HPOS=0:VPOS=0
60 GOSUB 29000
70 GOTO 70
28999 END
29000 COLOR C
29010 FOR I=1 TO LEN(A$)
29020 CHAR=57344+(ASC
(A$(I,I))—32) *8
29030 FOR J=0 TO 7
29040 LINE=PEEK (CHAR+J)
29050 HP=HPOS+I*8:VP=VPOS
+J
29060 IF LINE>=128 THEN
PLOT HP,VP:LINE=LINE—128
29070 IF LINE>=64 THEN PLOT
HP+1,VP:LINE=LINE—64
29080 IF LINE>=32 THEN PLOT
HP+2,VP:LINE=LINE—32
29090 IF LINE>=16 THEN PLOT
HP+3,VP:LINE=LINE—16
29100 IF LINE>=8 THEN PLOT
HP+4,VP:LINE=LINE—8
29110 IF LINE>=4 THEN PLOT
HP+5,VP:LINE=LINE—4
29120 IF LINE>=2 THEN PLOT
HP+6,VP:LINE=LINE—2
29130 IF LINE>=1 THEN PLOT
HP+7,VP
29140 NEXT J:NEXT I
29150 RETURN
```

Line 29050 actually causes the text to be printed out horizontally. If you wish you can adapt this slightly so that the text appears vertically. Although the program is not very fast it is written in Basic. The more experienced programmers amongst you will be able to adapt and improve on it.

DISPLAY TYPE	GRAPHICS MODE	COLOURS	COLUMNS X ROWS	RAM USED
TEXT	0	1 COL. 2 LUM	40 X 24	992
WIDETEXT	1	5 COL.	20 X 20 20 X 24	674 672
ENLARGED TEXT	2	5 COL.	20 X 10 20 X 12	424 420
FOUR	3	4 COL.	40 X 20 40 X 24	434 432
COLOUR	5	4 COL.	80 X 40 80 X 48	1174 1176
GRAPHICS	7	4 COL.	160 X 80 160 X 96	4190 4200
GRAPHICS	4	2 COL.	80 X 40 80 X 48	694 696
GRAPHICS	6	2 COL.	168 X 80 168 X 96	2174 696
HIGH RES. GRAPHICS	8	1 COL. 2 LUM	320 X 161 320 X 196	8122 8138
GTIA	9	1 COL. 16 LUM	80 X 160	8182
GRAPHICS	10	9 COL. 1 LUM	80 X 160	8182
MODES	11	16 COL. 1 LUM	80 X 160	8182

NEXT MONTH

In order to cover Antic Mode 4, a multicoloured GRAPHICS 0 screen on the Atari, you will need to know a little bit about redefining character sets. Next month I will be covering this topic in order to do some amazing things in Antic mode 4 the following month. For those of you with the XL machines Antic 4 is the equivalent of your GRAPHICS 12 command. In order to use it to its greatest effect you will still need to know about character sets.

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Taskset & commodore 64

We're only writing games, and we're only writing for the 64. Rely on us to bring you the greatest games, the greatest concepts and the greatest value.

GYROPOD

NEW

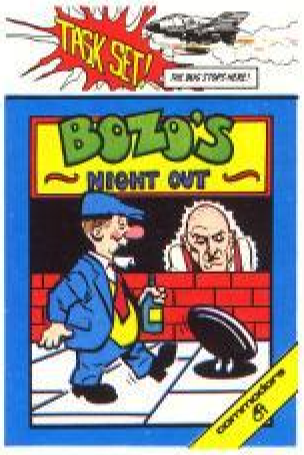
The complete deep space saga. A radical joystick action can bring inspired flexibility and a horrific kill-rate. The outstanding graphics include highly detailed craft and lots more than eight sprites at once. A full music and effects sound track accompanies the action. All these features combine with player options and a top 20 hi-score table to set new standards in hi-tech slaughter.



BOZO'S NIGHT OUT

NEW

A brand new character game. Poor old Bozo, all he has to do is to get home after a night out with the lads. That's easy until a wobble becomes a lurch and a stagger. Later into the night, all rules go out of the window as he disbelieves what's happening in front of his blood-shot eyes. An epic journey with ultra-smooth graphics and sprites which run rings round normal games.



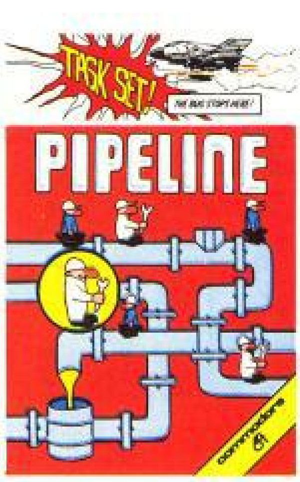
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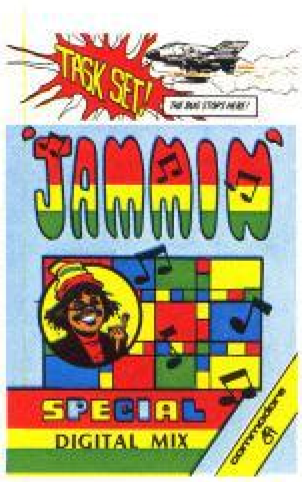
SUPER PIPELINE

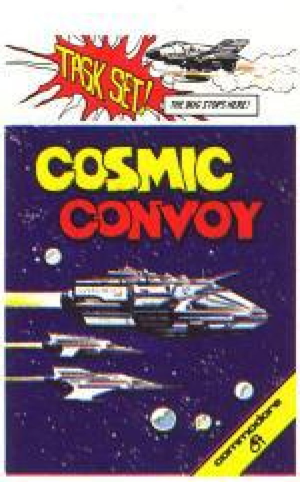
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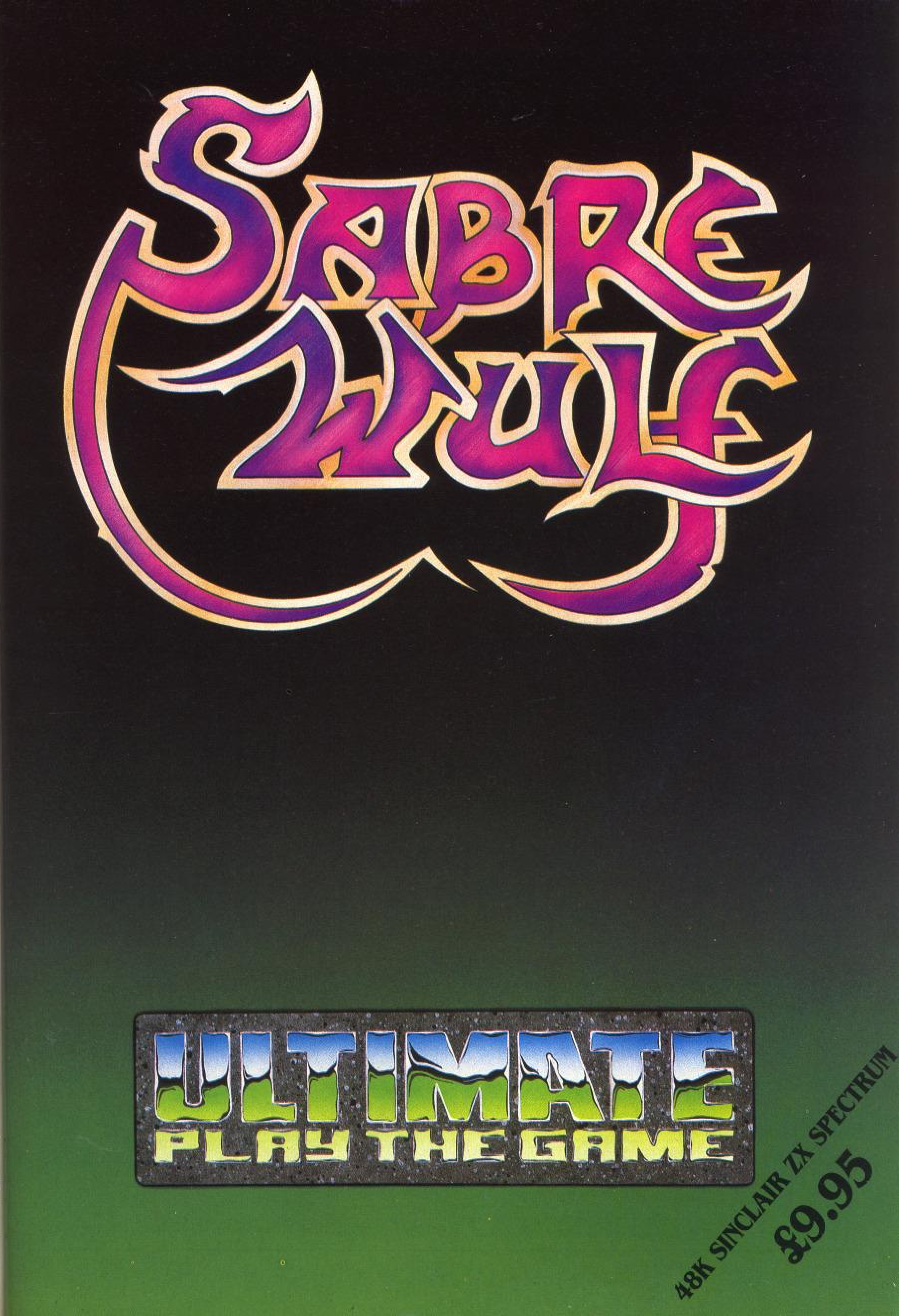
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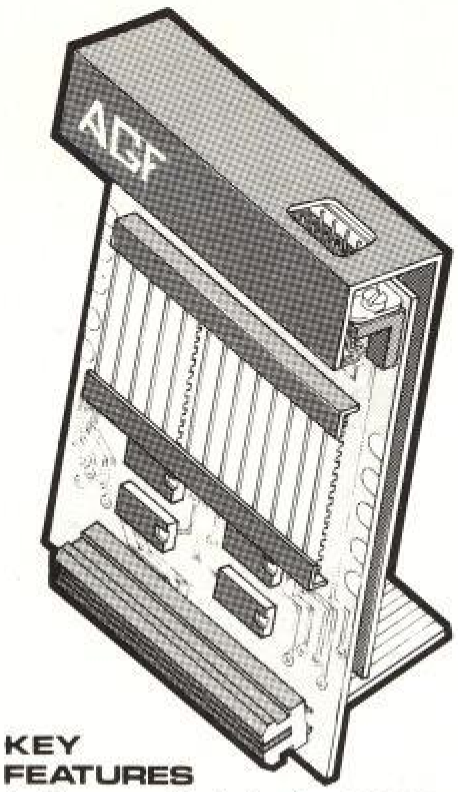
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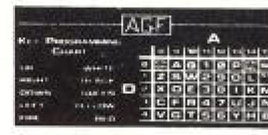


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for ORIC-1

by Kevin Freeman




```
1 CLS
5 INK2:PAPER0:POKE618,10
10 GOSUB300:GOSUB4000
15 POKE48680,3
100 REM.....CONTROL
101 REPEAT
105 T=2:TT=2:R=0:Q$=KEY$
108 IFQ$=""THENGOTO150
110 IFQ$=" "THENGOSUB1000
115 IFQ$=","THENT=-1:TT=3:GOTO130
120 IFQ$="."THENT=3:TT=-1
125 A1$=LEFT$(A$,2):A2$=RIGHT$(A$,35)
128 A$=A2$+A1$:GOTO150
130 A1$=LEFT$(A$,35):A2$=RIGHT$(A$,2)
135 A$=A2$+A1$
150 GOSUB2000
175 PLOT30,2,RIGHT$("     "+STR$(HI),5)
180 PLOT10,2,RIGHT$("     "+STR$(SC),5)
185 PLOT10,4,RIGHT$("  "+STR$(SH),2)
190 A=FRE("")
200 UNTILSH=0
201 PLAY0,0,0,0:CLS
202 CLS:R=1
```

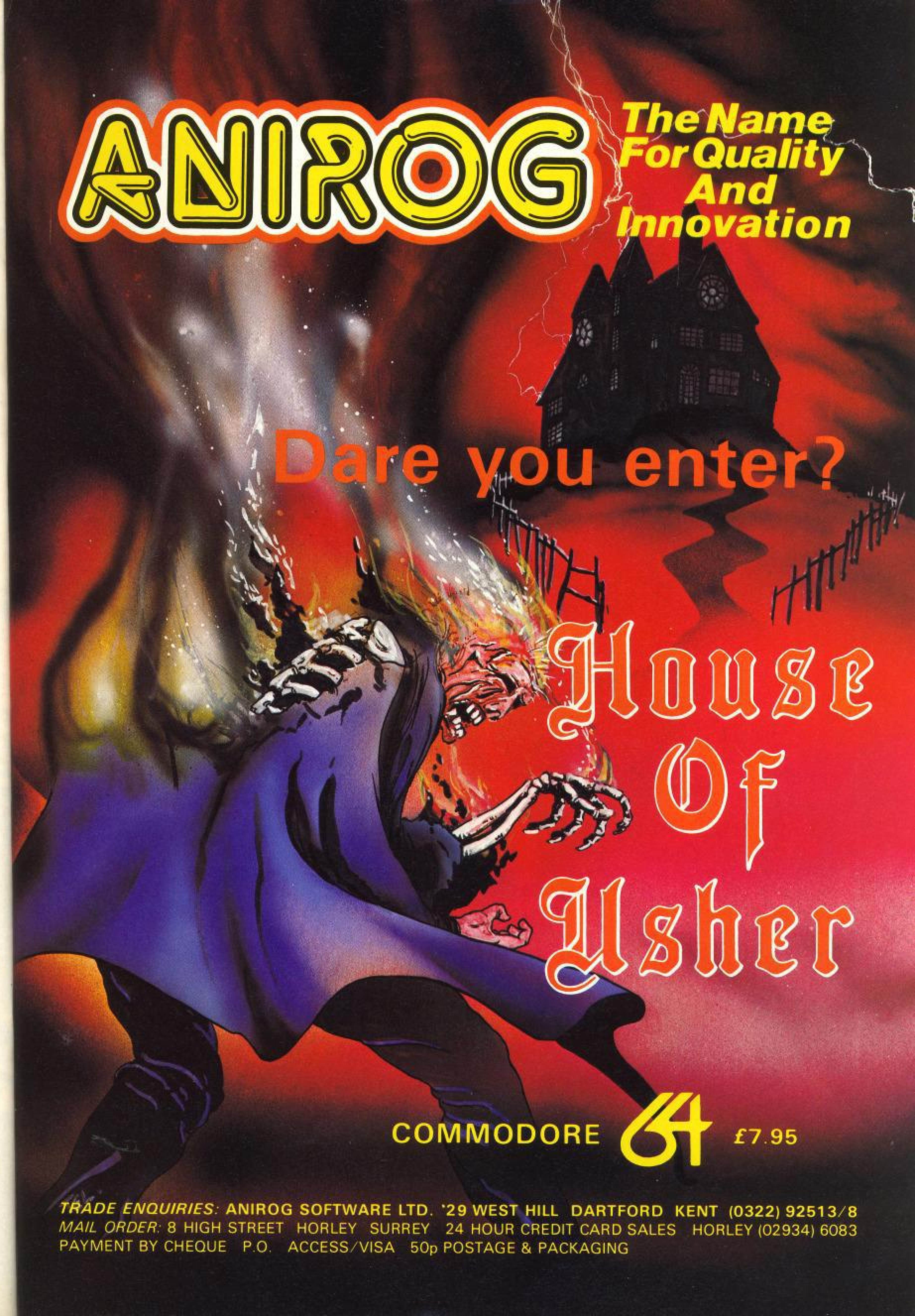
"I say, Corporal, there's some more of those nasty tank things hoving into sight. Be a good chap and traverse the old anti-tank gun in their direction, would you? When you've done that pop off a few shots at the bally things — but do be careful, we only have a few shells left. And, Corporal, keep the noise down. One has to have quiet during the cocktail hour."

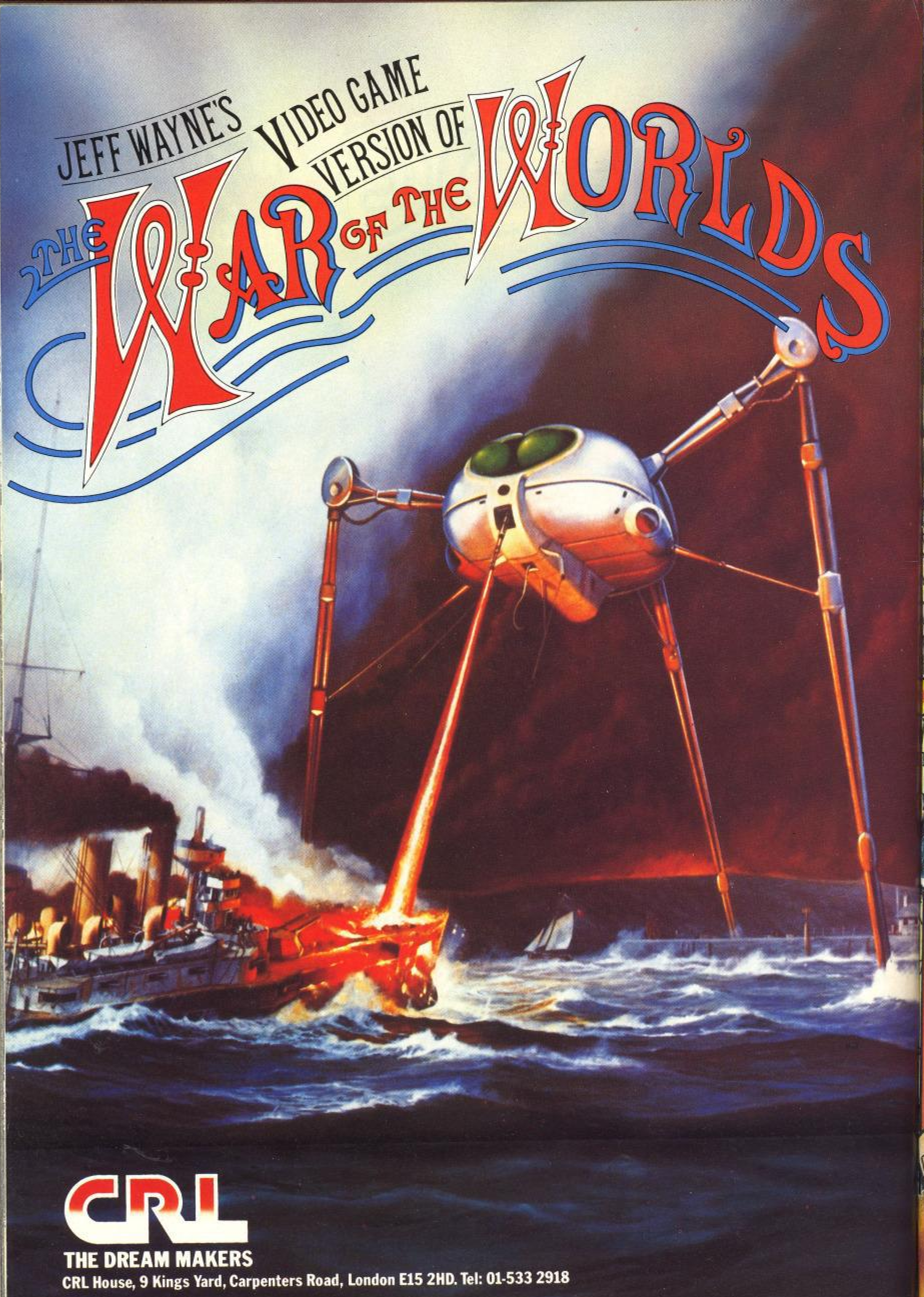
TANK ATTACK!

```
210 PLOT13,13,"GAME OVER"
220 PLOT2,20,"YOUR SCORE WAS:"
230 PLOT16,20,STR$(SC)
232 PLOT2,22,"PRESS 'Y' FOR ANOTHER GO"
234 Y$=KEY$
235 IFY$="Y"THENGOTO4015
236 GOTO234
240 END
300 PRINT:PRINT:PRINT
305 PRINTSPC(10);CHR$(4);CHR$(27)"NANTI
-TANK":PRINTCHR$(4)
310 PRINT:PRINT"KNOCK OUT AS MANY TANKS
 AS YOU CAN"
315 PRINT"WITH A LIMITED AMOUNT OF SHEL
LS"
318 PRINT"YOU CAN TRAVERSE TO THE RIGHT
":PRINT"OR LEFT"
320 PLOT12,15,"CONTROLS:"
330 PLOT12,18,"FIRE    (SPACE BAR)"
335 PLOT12,20,"RIGHT   (.)"
340 PLOT12,22,"LEFT    (,)"
345 GOSUB5000
350 PLOT9,10,"PRESS SPACE BAR TO START"
360 W$=KEY$
365 IFW$=" "THENRETURN
370 GOTO360
1000 REM.......FIRING ROUTINE.....
1005 EXPLODE:WAIT3
1010 SOUND2,5,0:PLAY2,2,5,10
1015 FR=FR-5
1050 FORY=16TO14STEP-2
1070 PLOT17,Y,"{":GOSUB2000
1090 PLOT17,Y," ":NEXT
1250 FORY=9TO12STEP3
1270 PLOT17,Y,"!":GOSUB2000
1290 PLOT17,Y," ":NEXT
1350 FORY=13TO15
1370 PLOT17,Y,"}":GOSUB2000
1390 PLOT17,Y," ":NEXT
1393 IFX<18ANDX>15THENGOSUB2500
1394 IFX1<18ANDX1>15THENGOSUB2550
1399 SOUND4,300,6:PLAY2,7,1,0
1400 PLOT17,16,"*"
1420 GOSUB2000
1430 PLOT17,16," "
1435 PLAY0,0,0,0
1495 SH=SH-1
1500 POP:GOTO150
2000 REM.......ENEMY TANK...........
2005 PLOT1,17,CHR$(2)+A$
2010 PLOTX,16,"   ":PLOTX1,16,"   "
2018 IFT1>360THENT1=2
2020 IFT1<2THENT1=360
2022 IFT1<2ORT1>35THENGOTO2100
2023 SOUND6,3100,0:PLAY6,2,4,10
2025 X=T1
2030 POKE48680,3:PLOTX,16,"uvw"
2040 PLAY0,0,0,0
2100 T1=T1-T
2104 IFT2>360THENT2=2
2105 IFT2<2THENT2=360
2108 IFT2<2ORT2>35THENGOTO2125
2109 SOUND6,3000,0:PLAY6,2,4,10
2110 X1=T2
2115 POKE48680,3:PLOTX1,16,"xyz"
2120 PLAY0,0,0,0
2125 T2=T2+TT
2200 RETURN
2500 REM.......HIT TARGET..........
2510 PLAY0,0,0,0:EXPLODE
2515 PLOTX,16,":*:":WAIT6
2520 T1=INT(RND(1)*300+40)
2522 PLOTX,16,"   "
2530 SC=SC+200+FR
2535 IFHI<SCTHENHI=SC
2540 X=1:FR=100
2549 RETURN
2550 PLAY0,0,0,0:EXPLODE
```

```
2555 PLOTX1,16,":*:":WAIT6
2560 T2=INT(RND(1)*150+150)
2575 PLOTX1,16,"   "
2580 SC=SC+200+FR
2585 IFHI<SCTHENHI=SC
2590 X1=1:FR=100
2599 RETURN
4000 REM.....SET VARIABLES........
4010 HI=0
4015 SC=0:SH=50:FR=100:CLS
4020 A$="aaaaabaaaaabaaaaabaaaaabaaaaab
aaaaab"
4030 T1=INT(RND(1)*250+50)
4031 T(1)=INT(RND(1)*250+50)
4032 T2=INT(RND(1)*250+50)
4100 REM........SET SCREEN..........
4101 CLS
4110 FORI=17TO26:PLOT1,I,2:NEXT
4150 POKE48121,1:POKE48201,5
4151 PLOT1,2,"SCORE  :"
4156 PLOT1,4,"SHELLS :"
4160 PLOT20,2,"HI-SCORE :"
4180 PLOT16,20,"hi"
4182 PLOT15,21,"agjo"
4184 PLOT15,22,"bgkp"
4186 PLOT15,23,"cgkq"
4188 PLOT15,24,"dglr"
4190 PLOT15,25,"egms"
4192 PLOT15,26,"fgnt"
4235 FORI=48036TO48039:POKEI,32:NEXTI
4250 IFR=1THENGOTO100
4299 RETURN
5000 FORI=46856TO47087:READW:POKEI,W:NE
XT
5210 DATA0,0,0,1,1,1,1,1
5215 DATA1,1,1,3,3,3,3,3
5220 DATA3,3,3,7,7,7,7,7
5225 DATA7,7,7,15,15,15,15,15
5230 DATA15,15,15,15,31,31,31,31
5235 DATA31,31,31,31,63,63,63,63
5240 DATA63,63,63,63,63,63,63,63
5245 DATA0,0,3,3,15,31,31,63
5250 DATA0,0,48,48,28,30,30,31
5255 DATA31,31,31,31,31,31,31,31
5260 DATA15,15,15,15,15,15,15,15
5265 DATA7,7,7,7,7,7,7,7
5270 DATA3,3,3,3,3,3,3,3
5275 DATA1,1,1,1,1,33,57,63
5280 DATA0,0,0,32,32,32,32,32
5290 DATA32,32,32,48,48,48,48,48
5295 DATA48,48,48,56,56,56,56,56
5300 DATA56,56,56,60,60,60,60,60
5305 DATA60,60,60,60,62,62,62,62
5310 DATA62,62,62,62,63,63,63,63
5315 DATA0,63,0,0,3,15,15,7
5320 DATA7,63,15,31,63,63,63,63
5325 DATA32,60,56,48,62,63,63,62
5330 DATA1,15,7,3,31,63,63,31
5335 DATA56,63,60,62,63,63,63,63
5240 DATA63,63,63,63,63,63,63,63
5245 DATA0,0,3,3,15,31,31,63
5250 DATA0,0,48,48,28,30,30,31
5255 DATA31,31,31,31,31,31,31,31
5260 DATA15,15,15,15,15,15,15,15
5265 DATA7,7,7,7,7,7,7,7
5270 DATA3,3,3,3,3,3,3,3
5275 DATA1,1,1,1,1,33,57,63
5280 DATA0,0,0,32,32,32,32,32
5290 DATA32,32,32,48,48,48,48,48
5295 DATA48,48,48,56,56,56,56,56
5300 DATA56,56,56,60,60,56,56,56
5305 DATA60,60,60,60,62,60,60,60
5310 DATA62,62,62,62,63,62,62,62
5315 DATA0,63,0,0,3,15,15,7
5320 DATA7,63,15,31,63,63,63,63
5325 DATA32,60,56,48,62,63,63,62
5330 DATA1,15,7,3,31,63,63,31
5335 DATA56,63,60,62,63,63,63,63
5340 DATA0,63,0,0,48,60,60,56
5345 DATA30,30,63,63,63,30,30,0
5350 DATA0,12,30,30,12,0,0,0
5355 DATA0,0,8,28,8,0,0,0
5400 RETURN
```

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